LG Electronics

LATS CAD

User's Manual

CAD Drawing & System Check Simulation Program's Tutorial & Manual

LG Electronics
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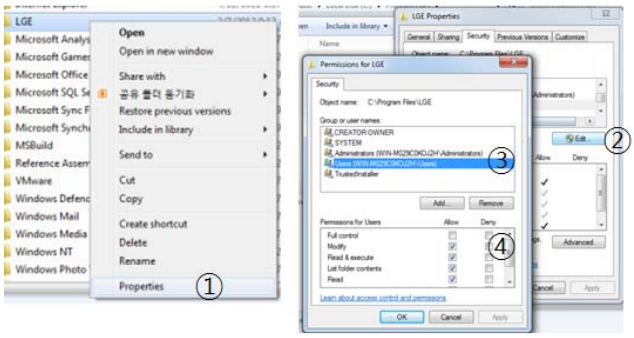
System Requirement

Software

- LATS CAD_32bit:
  1. OS: WindowsXP_with SP3 (32bit), Windows7_with SP1 (32bit)
  2. AutoCAD: 2007, 2008, 2009, 2010, 2011, 2012 (32bit)
  3. MS Office Excel, Access (32bit, 2003, 2007, 2010)
- LATS CAD_64bit:
  1. OS: WindowsXP_with SP3 (64 bit), Windows7_with SP1 (64 bit)
  2. AutoCAD: 2010, 2011, 2012 (64 bit)
  3. MS Office Excel, Access (64bit, 2010 Professional)

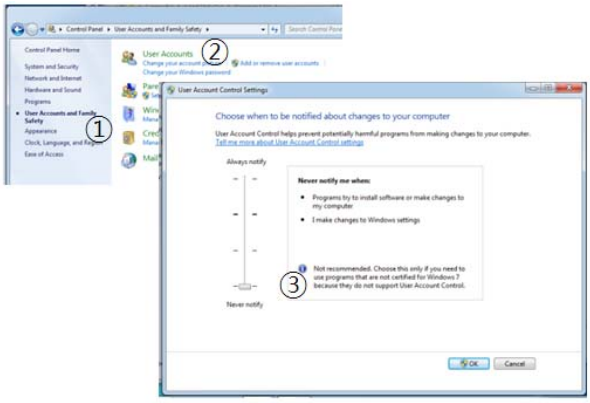
For Using the “LATS CAD_64bit”

1. Please check the directory’s security “C:₩Program Files₩LGE”



Check the “Modify” of permission for Users

2. Please check the control setting for auto update.

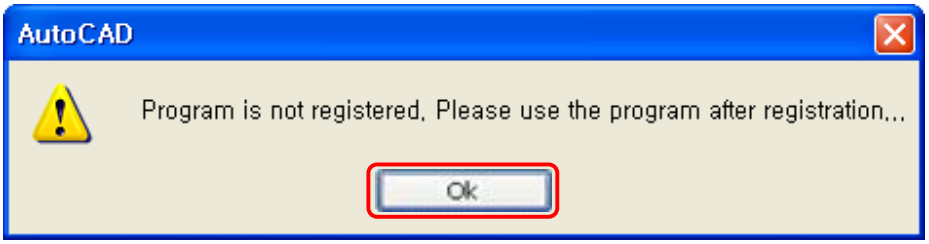


Following

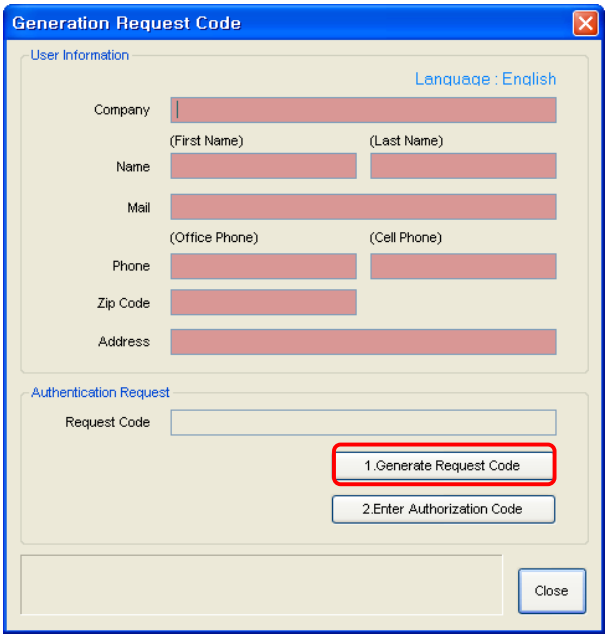
This chapter is written about explanation of functions at LATS, and method and process how to use the functions in general. And It consists of explanation of each functions that user of LATS can understand the functions, when they follow this chapter step by step. If you want more detailed descriptions of each function, check reference page.

User Registration

1. When LATS is executed after Tool Install, a program authentication request message will be generated. (or please input appload(ap) in command line)



2. When Confirm is selected, the authentication request code generator is generated. (After user information input, select "Generate Request Code")

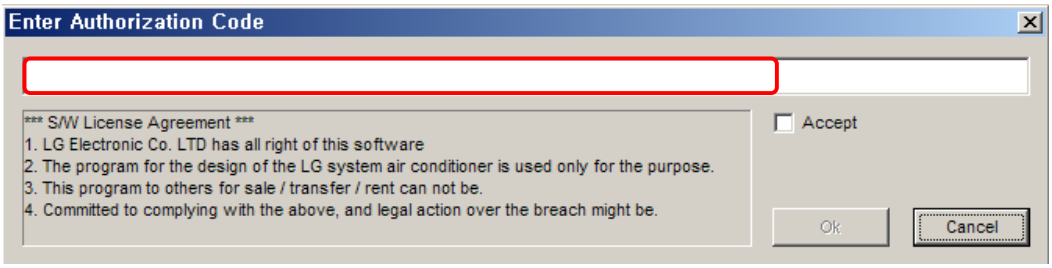


3. The Request Code is created in the background screen of the User PC. (.dat file)

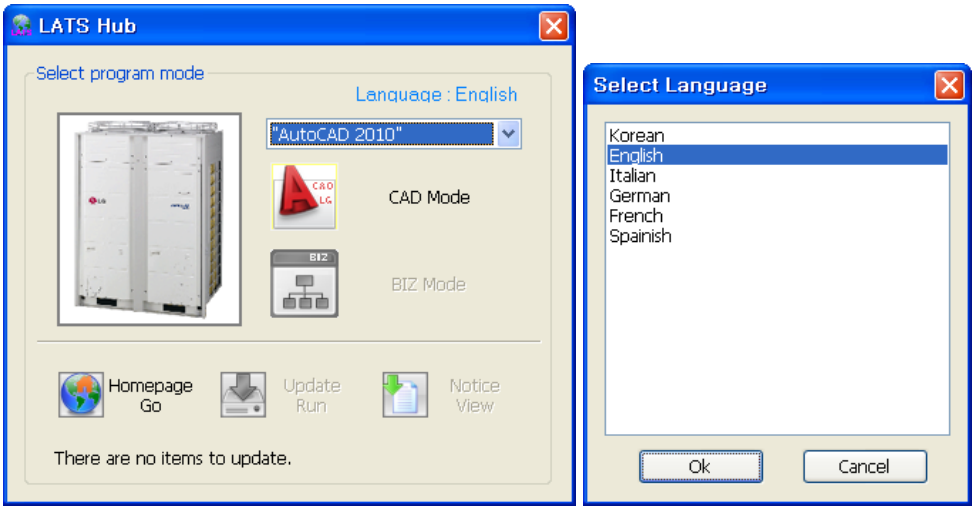
4. Copy the Request Code (.dat file) and send to LATS operation manager with an e-mail.

5. After verification by LATS operation manager, Authentication Code will be issued. (Returned through an e-mail)

6. Select "Enter Authentication Code" in Request Authentication Code Generator, and input the received Authentication Code.


Enter Authorization Code
*** S/W License Agreement ***
1. LG Electronic Co. LTD has all right of this software
2. The program for the design of the LG system air conditioner is used only for the purpose.
3. This program to others for sale / transfer / rent can not be.
4. Committed to complying with the above, and legal action over the breach might be.
Accept
Ok
Cancel

LATS Execution



1. Select Language to apply (Select from Korean, English, Italian, German, French and Spanish)
2. Select AutoCAD version
3. Select LATS mode (CAD mode)
4. View updates or notices (It is activated when there is an update or a notice.)

Caution! BIZ mode can not select.

LATS Auto Update

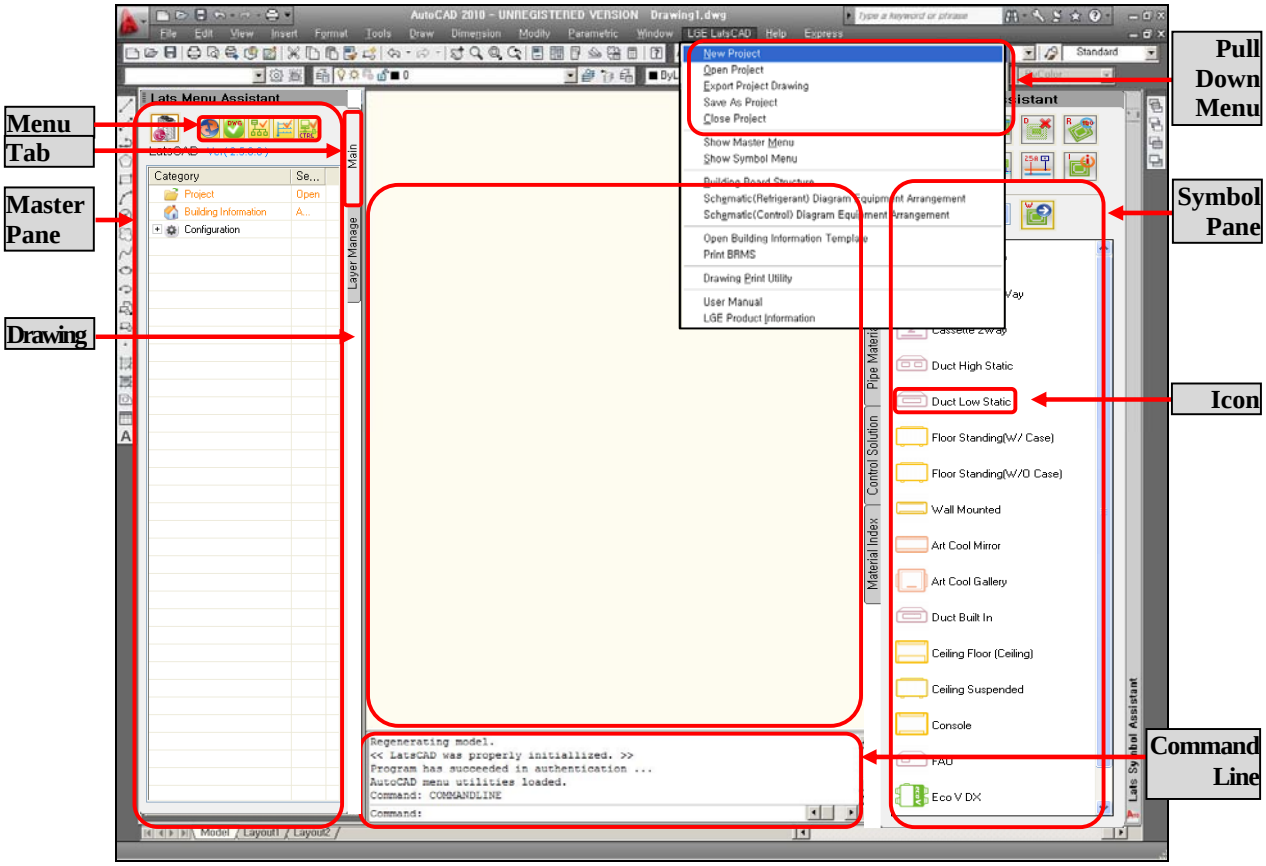
When there is an update, please run update.

LATS CAD Window

LATS CAD Window is composed with 2 Panes, Drawing, Pull Down Menu, and Command Line.

Pane has 2 types as Master Pane at left of window and Symbol Pane at right of window. And to show Master Pane or Symbol Pane, check Show Master Menu, Show Symbol Menu of Pull Down Menu. Master Pane has 2 Tabs of Main Tab and Layer Manage Tab. And Symbol Pane has 5 Tabs of Indoor Unit Tab, Outdoor Unit Tab, Pipe Material Tab, Control Solution Tab, and Material Index Tab.

LATS CAD has Menus and Icons in the each Tab. The Menus has function of Equipment Editing, System Diagram Drawing, and System Checking. The Icons are equipments, pipes, setting environment, etc.



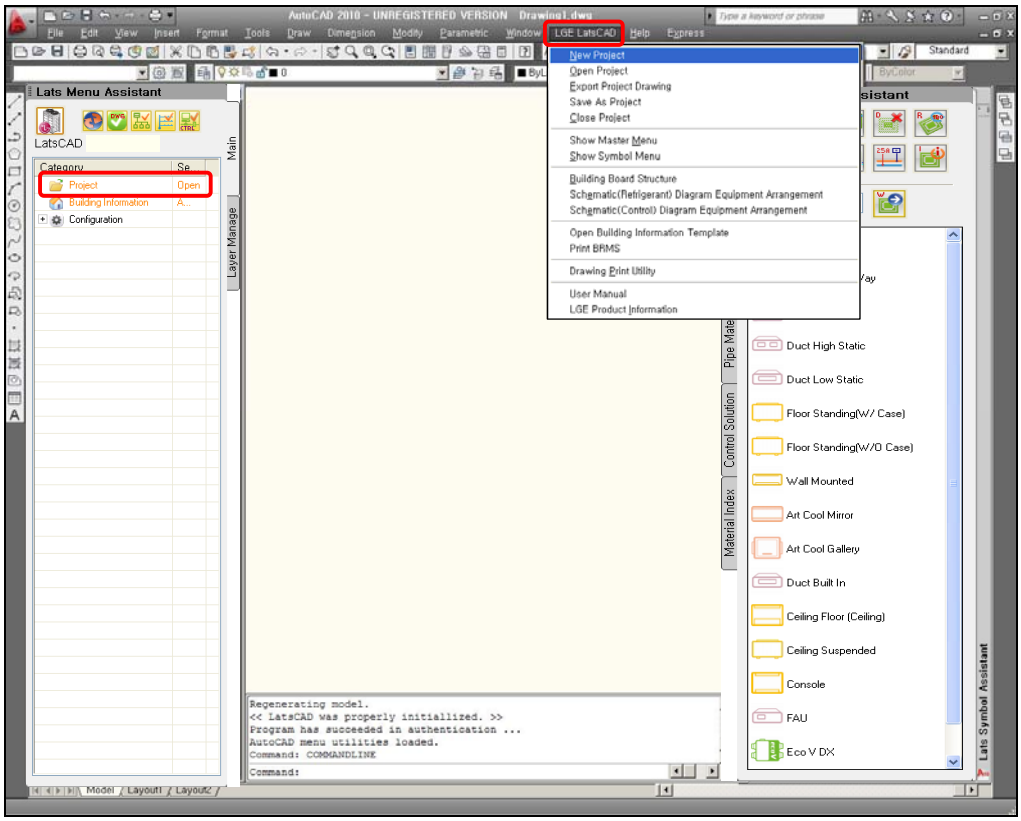
Project Management

Use New Project to create a new project, and input Project Information.

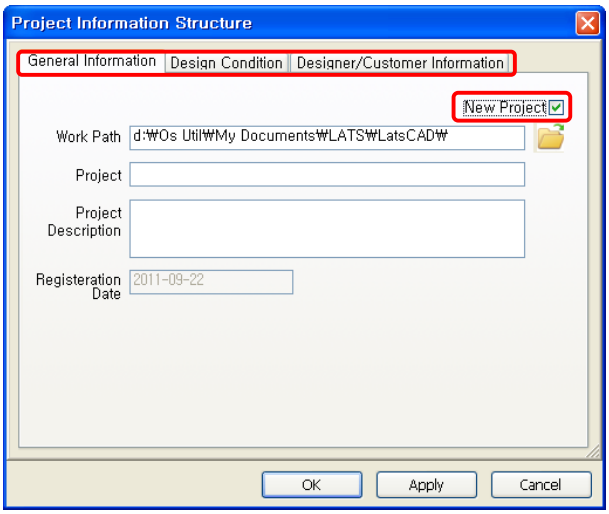
Project Creation

1. Select New Project to set Project Information. The project folder is created at the designated location.

   (Master Pane → "Open" of Project or Select LGE LATSCAD → New Project in Pull Down Menu)



2. Input each of the information by clicking general information, design condition, and designer/Customer Information tab. (Check New Project)

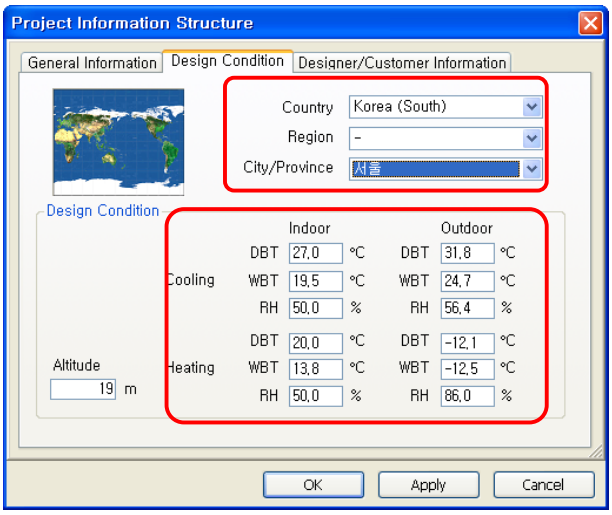


2.1 General Information

- Work Path: Project Folder
- Project: Project Name
- Project Description: Other Project Information
- Registration Date: Working Date (automatically input)

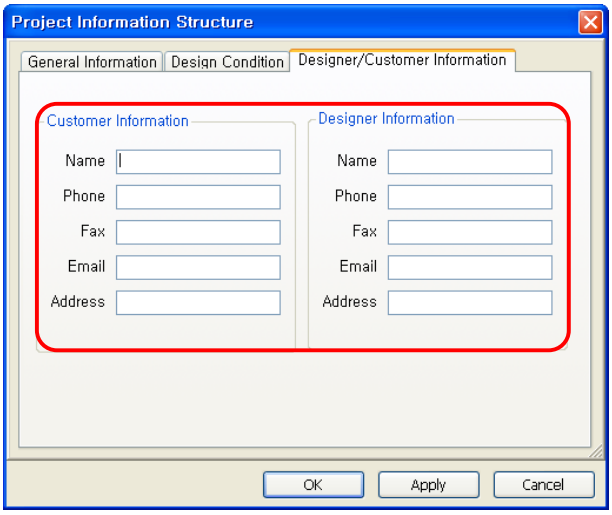
2.2 Design Condition

- It sets country, region, and city.
- It verifies cooling/heating dry gate and wet gate temperature conditions.



2.3 Designer/Customer Information

- Input Designer/Customer Information.



Space Information Creation

It creates buildings, floors, and rooms, which are the basic setting elements of the drawing, and sets the Reference Point and area.

There 2 ways, inserting by making an Excel Sheet and directly registering to Master Pane.

Building Creation (Using Excel Sheet)

After creating a Project, create Space Information using Excel Sheet.

Read Information defined in Excel Sheet to create buildings, floors, and rooms.

< Excel Building Information >

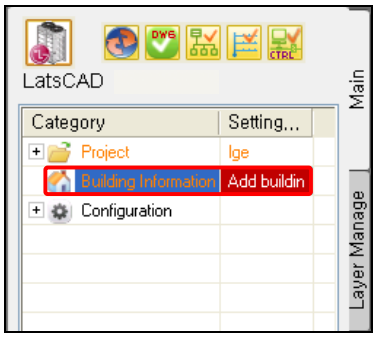
1. Input Building, Floor, and Room Information, location of the drawing, floor height, and room area in the Excel Sheet template.

Template File is in Dat folder under Program folder. (BldgInfo_Template.xls) The path of the drawing can be input through the interactive box by the user.

	A	B	C	D	E	F	G	H	I	J
1	Building Information	Name	TEST							
2		File Name								
3		Scale 1 :	100.0	Up	2.0	Down	1.0	Height	3.5	
4										
5	Floor	Room	Height	Heating Total heat		Cooling Sensible heat		Heating Total heat		Area
6				Unit Load	Load	Unit Load	Load	Unit Load	Load	
7	2F		4.0		0.0		0.0		0.0	
8	1F	1R	4.0							
9		2R	4.0							
10		3R	4.0							
11		4R	4.0							
12	1B		4.0		0.0		0.0		0.0	

Caution! When changing the template format, change(insert) only Row Information of the marked category. If other categories are changed, an Error will occur when the Building Information is extracted from the Project.

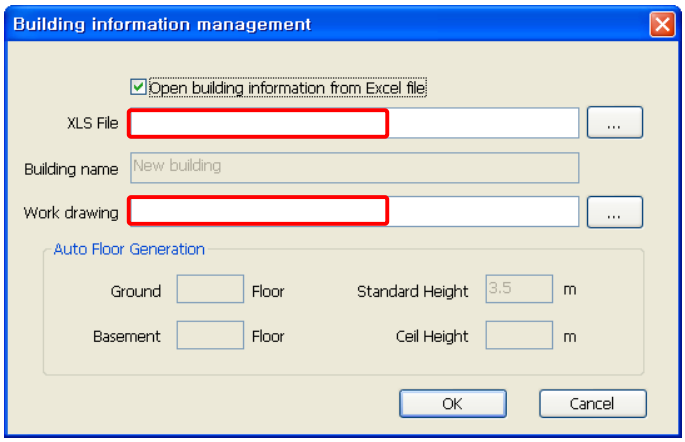
2. Designate the prepared Excel Sheet to create buildings, floors, and rooms.



2.1 Select "Add Buildings" in Building Information in Master Pane.

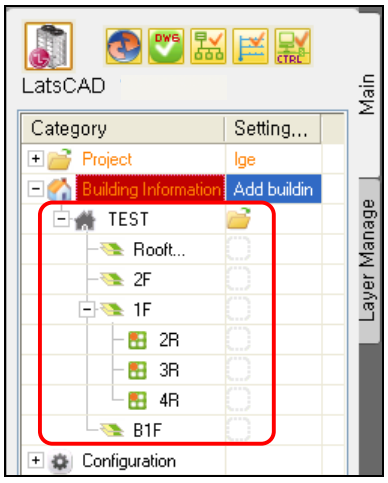
2.2 Select "Open Building Information from Excel file" in "Building Information Management"

2.3 Select the Excel File (File with Building Information input in the template) and drawing



3. The Building Information input in the Excel File is applied

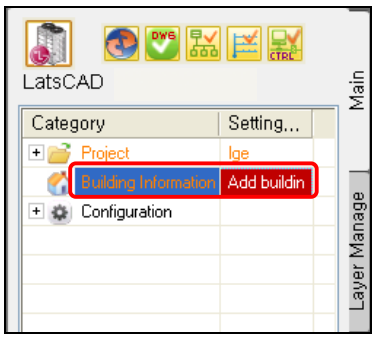
- Test Building is created, and if Room Information is input in the Excel File, Room Information is also applied.



Building Creation (Using Master Pane)

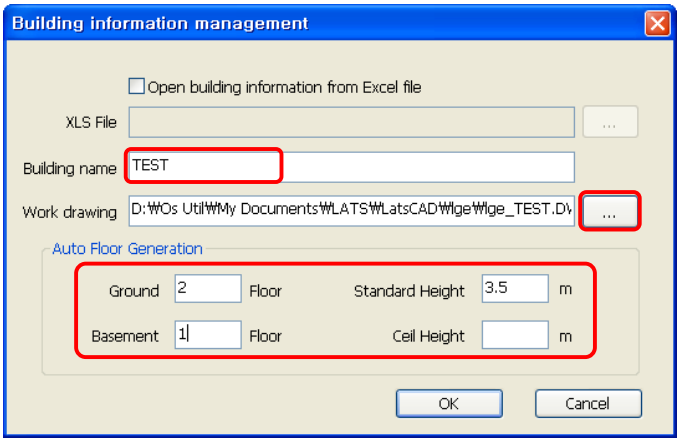
Create Space Information in the Main Tab of Master Pane

1. Select "Add Buildings" of Building Information.



2. Input Building Name, Floor, and Standard Floor Height, and designate the drawing.

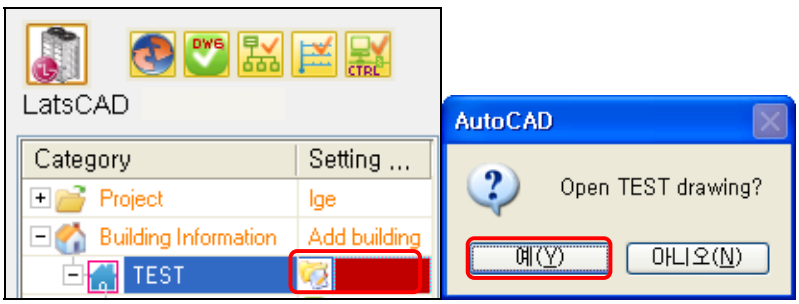
2.1 Drawing name is saved as Project Name_Building Name.dwg, and is copied to Project folder.



Caution! When ceiling concealed duct type Indoor Unit is selected, and it designates the ceil height. Don't have to be input the other case.

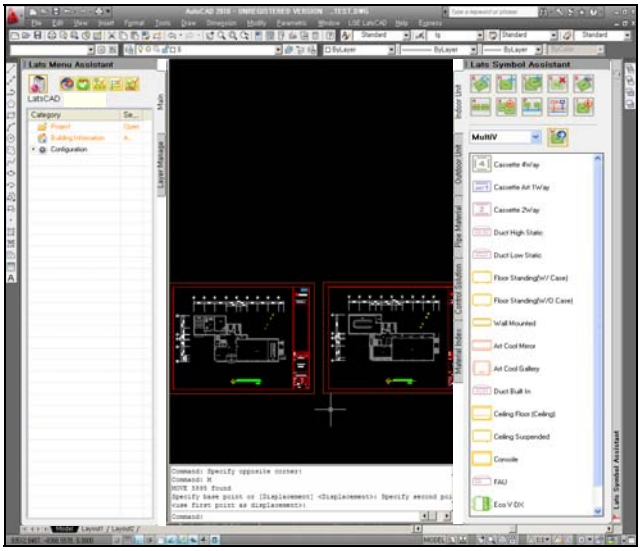
3. Building Information is created as the same in "Open Building Information from Excel File".

4. Opening Building Drawing (Select Building Information and Open the Drawing)



5. For the case of creating building using ExcelSheet, the following steps are also the same.

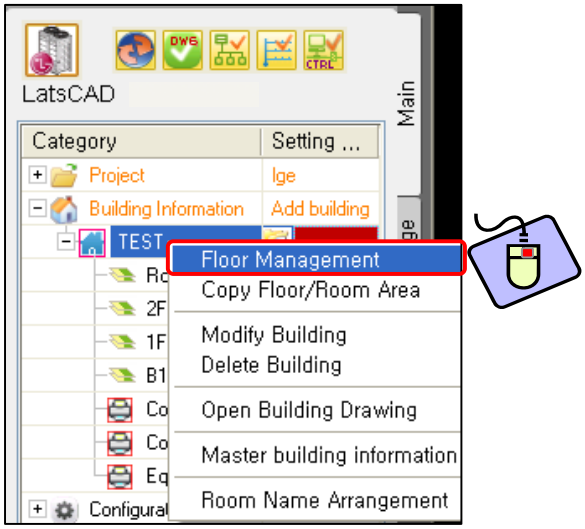
Caution! Default Scale is 1:1



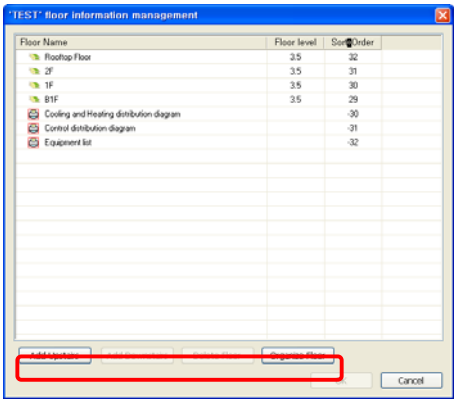
Floor Management

It can modify/insert/delete of floor information selected automatically, when building creation

1. While Building is selected, after clicking right mouse button, select Floor Management.



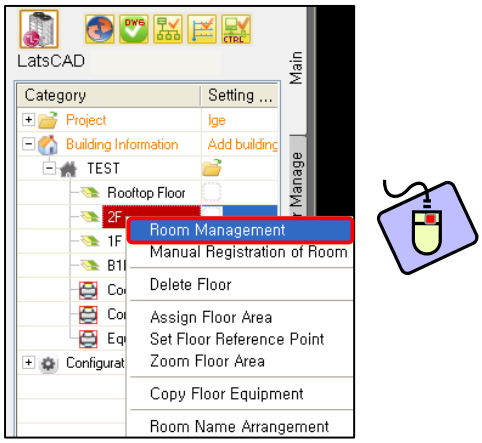
2. If add/delete is needed in addition to the set floors, use Add Floor/Delete Floor function. (Add/Delete after selecting the Floor).



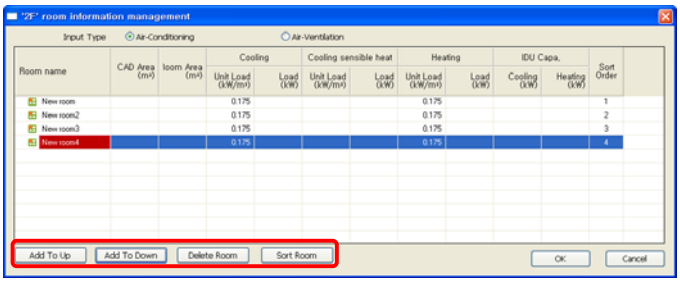
Room Management

It can input room information of each floor.

1. While Floor is selected, after clicking the right mouse button, select Room Management.



2. Room Add/Delete is possible for the selected floor.

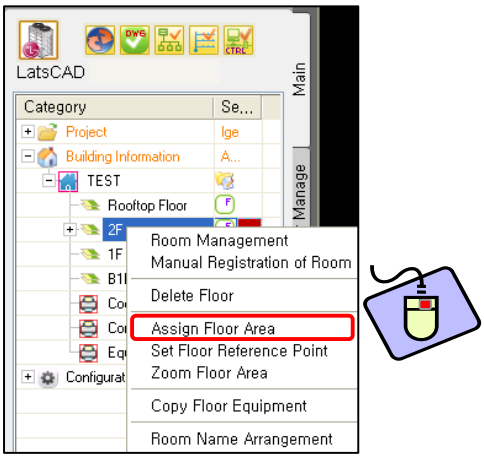


Area Designation

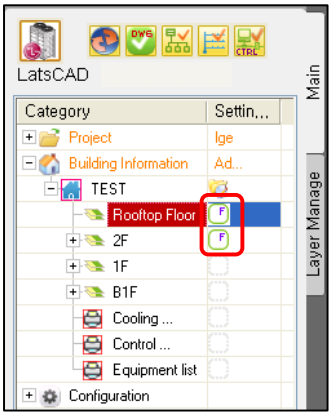
It designates Floor Area, Reference Point, and Room Area.

Caution! To copy Floor/Room Area, the Reference point of the floor to be copied shall be set first.

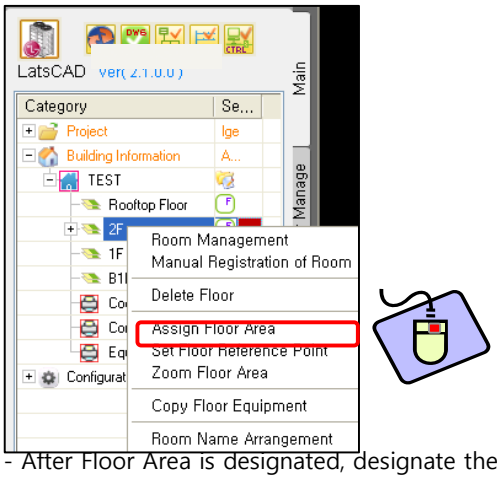
1. Assign Floor Area



- Designate Floor Area using rectangle and poly line, or designate certain area as the Floor Area using Boundary Selection.

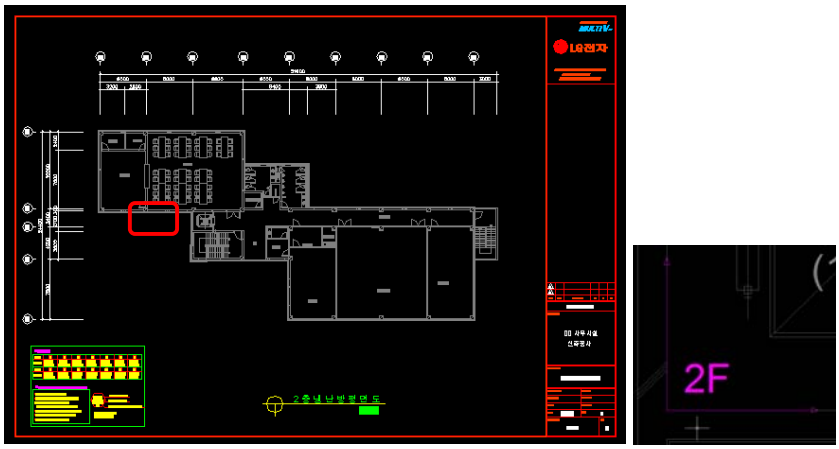


2. Set Floor Reference Point

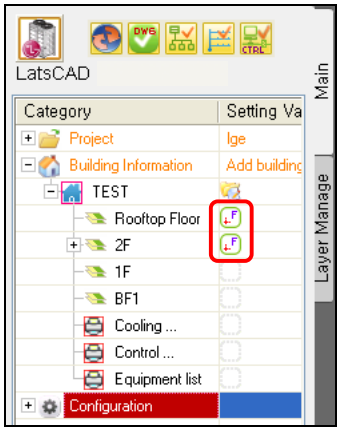


- After Floor Area is designated, designate the Reference Point of the floor.

- Set the point being the base of each floor as the Reference Point.

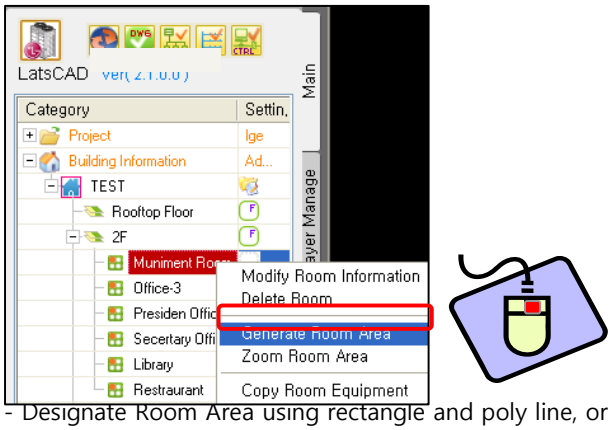


- When the Designation of Floor Area and the Setting of Floor Reference Point are completed, the Floor Icon is updated in Master Pane.

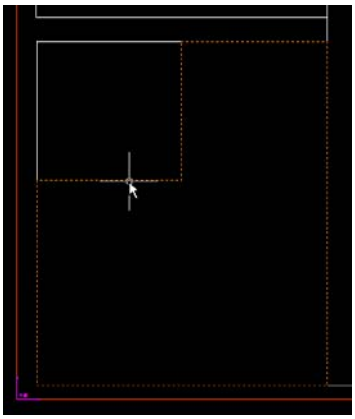


3. Generate Room Area

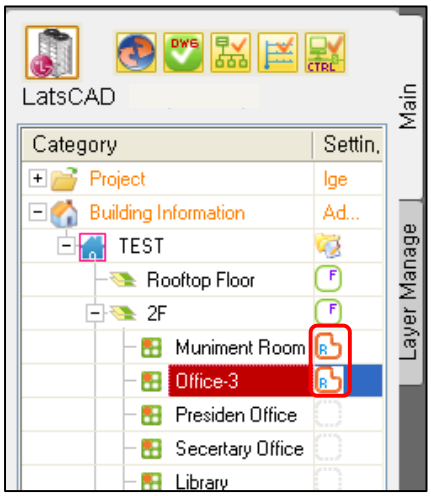
detailed function of each button.



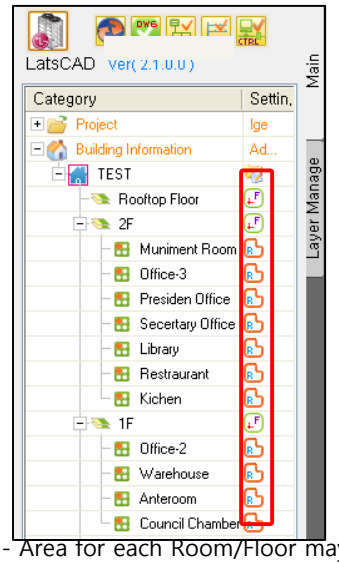
- Designate Room Area using rectangle and poly line, or designate certain area as the Room Area using Boundary Selection.

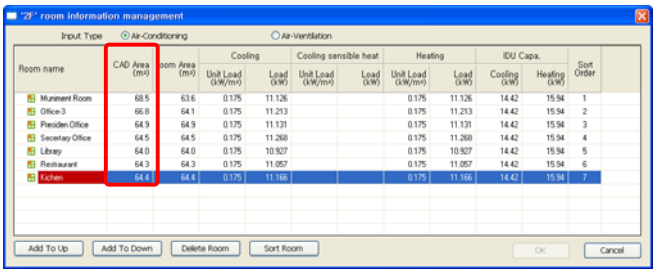


- When Floor and Room Area are designated, Room Icon is updated in Master Pane.



- When the designation of Floor Area/Floor Reference Point/Room Area is completed, all icons in Master Pane are updated, and the area for each room is recognized in CAD.

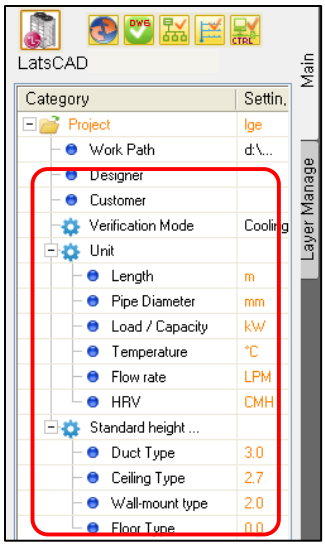


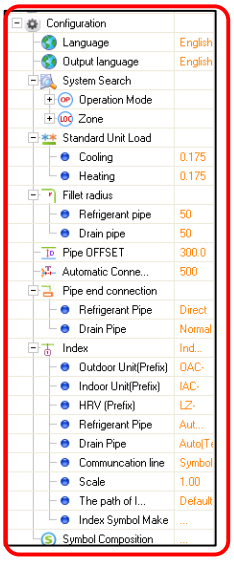


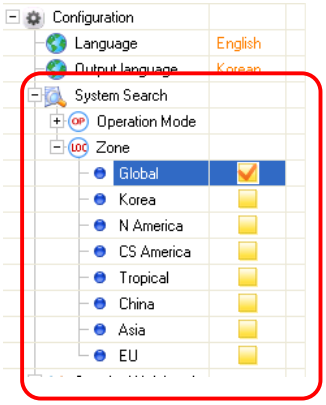
- Area for each Room/Floor may be Expanded/Deleted through Other Area Expansion/Deletion function.

Environment Setting

1. It sets the data for Unit for each Project and Standard Height of Indoor Unit.







2. It sets various data through Environment Setting.

Caution! Check Zone of System Search to change Model name for each Product according to the selected region

Equipment Positioning

It selects equipments such as Indoor Unit and Outdoor Unit to position them in the drawing.

Indoor Unit Positioning

Indoor Unit Positioning method has 2 types as Normal Positioning and Auto-arrange Indoor Unit.

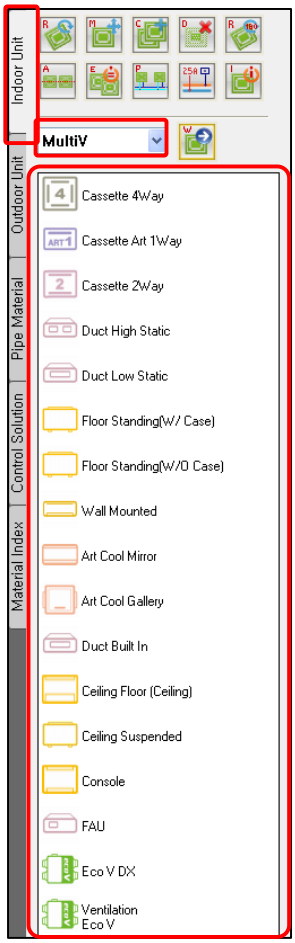
1. Normal Positioning

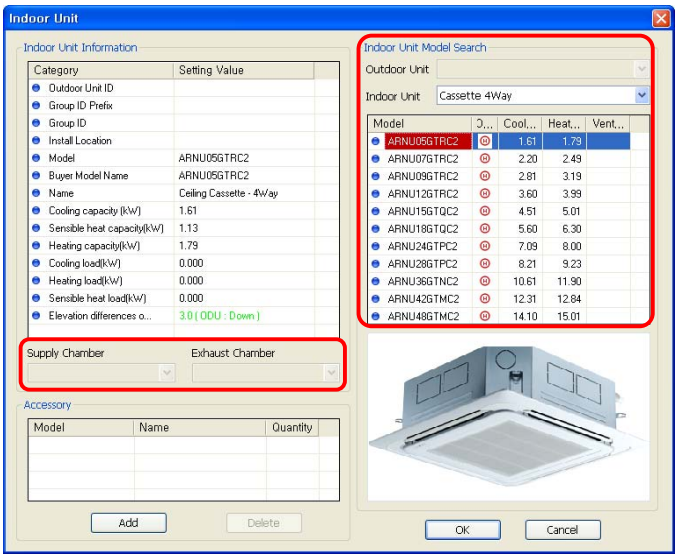
1.1 Select Indoor Unit tab in Symbol Pane.

1.2 Select Product Type. (MultiV, Multi, Single A, Single)

1.3 Double click Indoor Unit Type icon to be positioned in Indoor Unit tab.

1.4 Select desired Model, and click OK button.

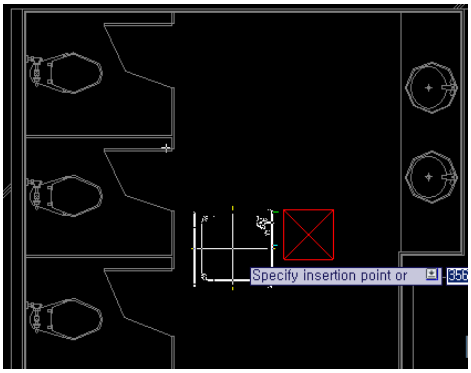


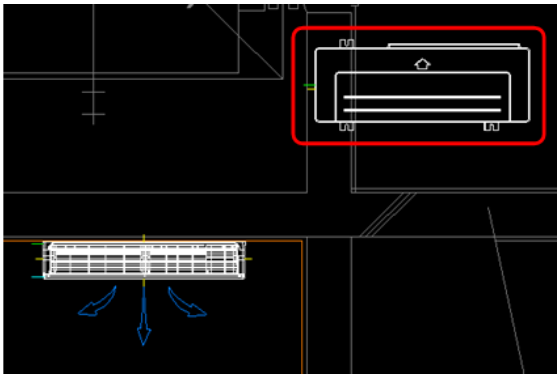


Caution! You may select air supply and exhaust chamber in case of ceiling concealed duct type (high static pressure) Indoor Unit.

1.5 Designate the equipment insertion position.

- If there is an equipment to position as a reference, click reference equipment, or press Enter.





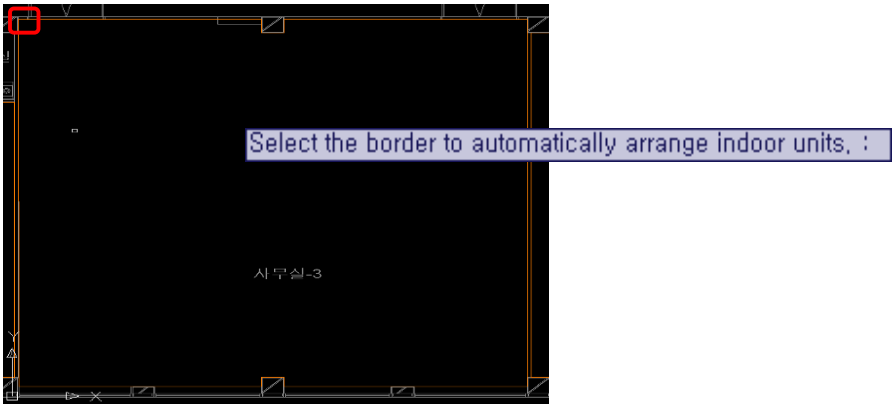
Caution! If Single is selected in Product Type, Outdoor Unit is immediately positioned after positioning Indoor Unit.

2. Auto-arrange Indoor Unit

Position using IDU Wizard function: only activated when Indoor Unit tab in Symbol Pane is selected

2.1 Select Auto-arrange Indoor Unit Menu in Symbol Pane. (MultiV Indoor)

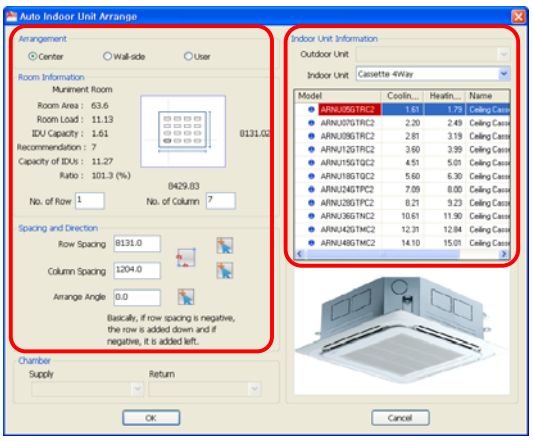
2.2 Select Room Area to position



2.2.1 Auto-arrange Indoor Unit

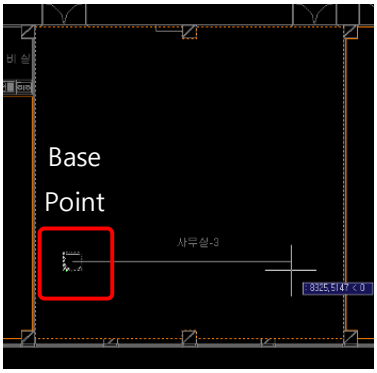
- Select Indoor Unit Type to position (The number of equipments is recommended according to the selected equipment)

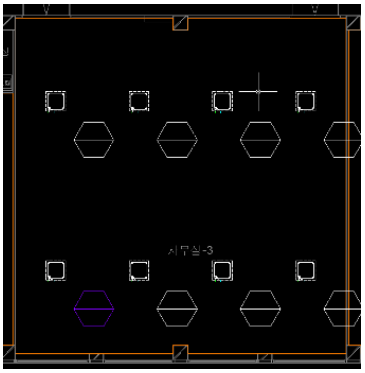
- Select Positioning Option (Positioning Type, Number of Positioning, and Positioning Distance)



2.3 Set Base Point in the drawing

- It is automatically positioned as the decided positioning direction/number of equipments/positioning distance)

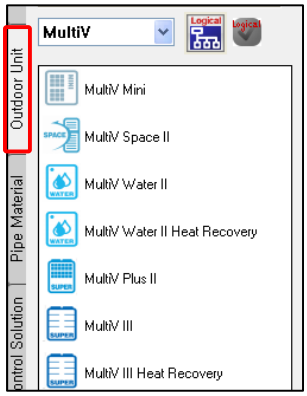




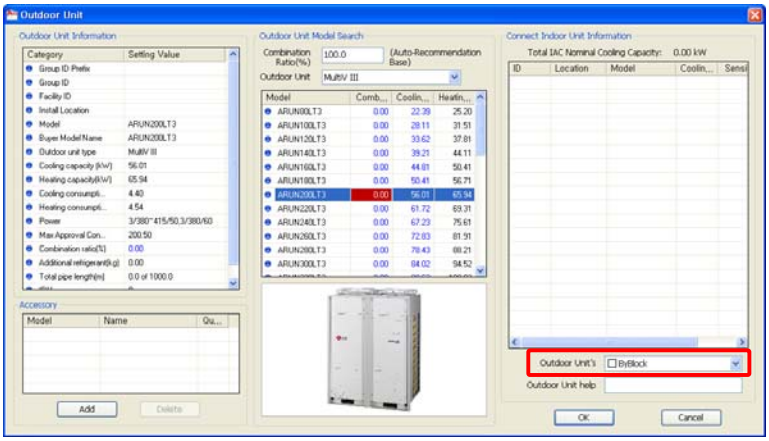
Outdoor Unit Positioning

1. Select Outdoor Unit tab in Symbol Pane.

2. Double click Outdoor Unit Type icon to position in Outdoor Unit tab.



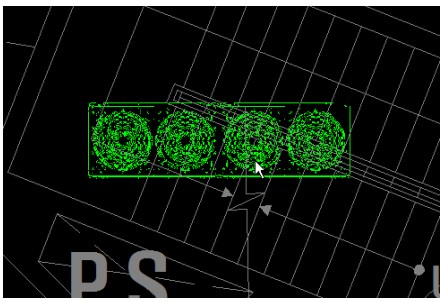
3. Select ODU Model, and click OK button.



- You may set only Indoor Units connected to the corresponding Outdoor Unit as one color by designating Outdoor Unit Group color.

4. Designate Equipment Insertion Position

- If there is an equipment to position as a reference, click reference equipment, or press Enter.



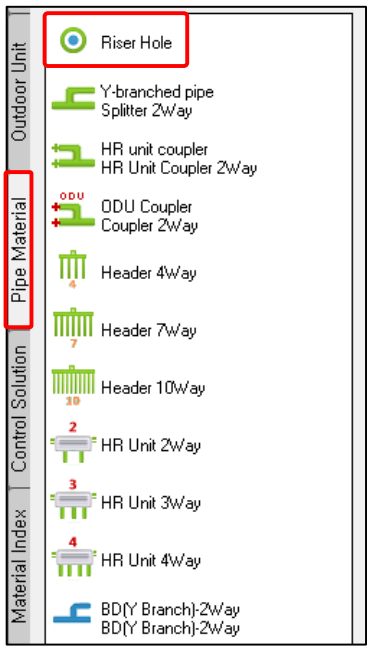
Pipe Connection

It positions the Riser Hole and draws Riser Hole to connect the positioned Outdoor Units and Indoor Units.

Riser Hole Positioning

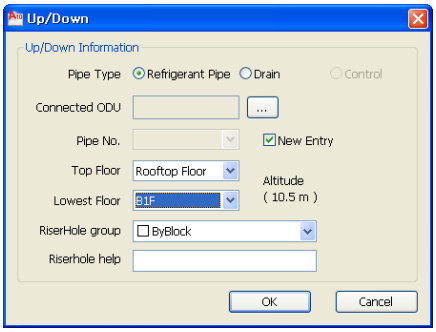
It positions the Riser Hole connecting floor to floor.

1. Double click Riser Hole icon in Pipe material tab in Symbol Pane.



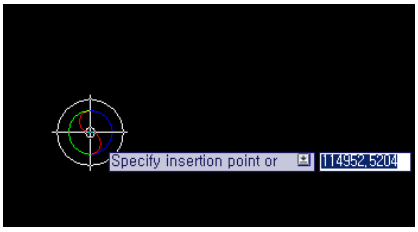
2. Designate Pipe Type (Refrigerant pipe, Drain pipe, Control), Top floor, and l Lowest floor, and Riser Hole group and OK Button, and press Enter.

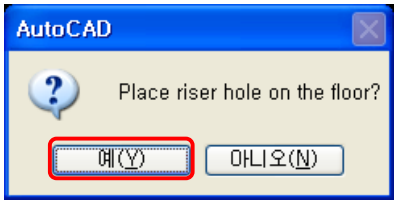
Caution! To designate Control of Pipe Type, check Control riser hole of Control Solution Tab of Symbol Pane.



3. Designate Riser Hole insertion point to position the Riser Hole.

- If there is an equipment to position as a reference, click reference equipment, or press Enter



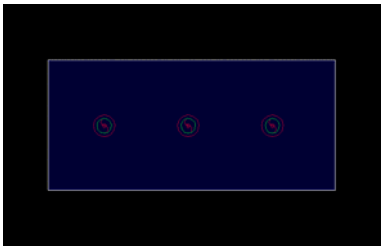


4. When 'Yes' is clicked, based on the Reference Point of the corresponding floor, the Riser Hole is positioned in the same position in each floor.

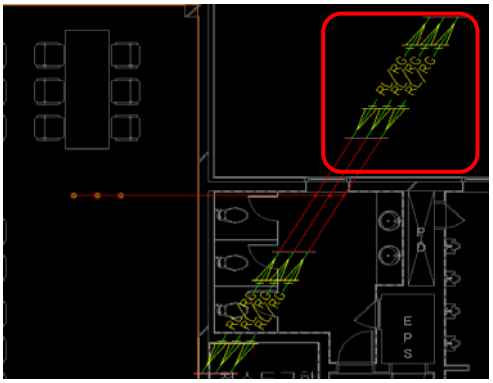
5. Positioning Riser Hole Notes

5.1 Select Equipment and Pipe index Menu in Symbol Pane.

5.2 Select Riser Hole to position Notes. (Multiple selection is possible using drag.)



5.3 When the position is designated, the Riser Hole note is positioned in the corresponding location.



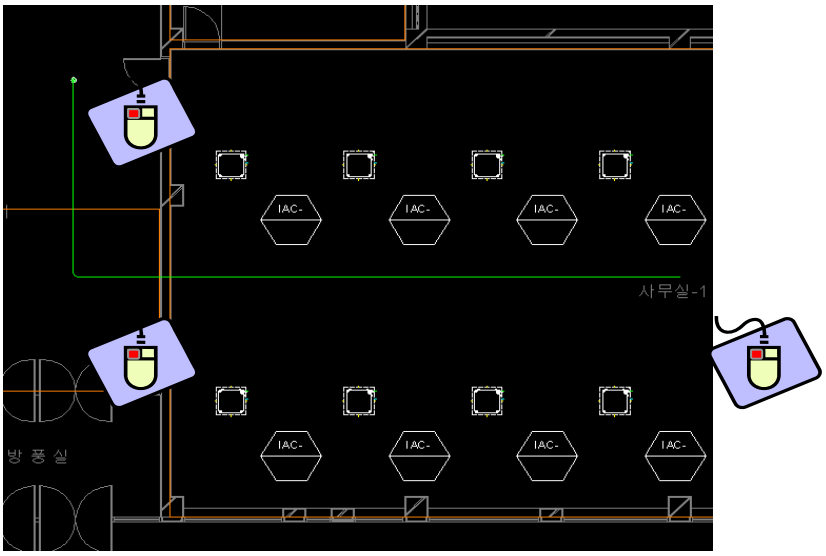
Refrigerant Pipe Connection

Through Piping Equipment Menu in Symbol Pane, Refrigerant Pipe can be drawn from Outdoor Unit or Riser Hole. In this case, show drawing method using Smart Wiring function.

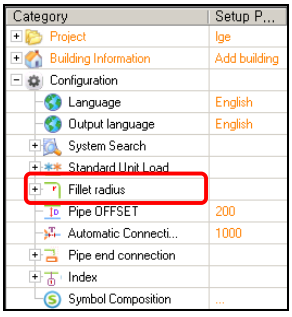
1. Draw Main Pipe by clicking Mouse from Riser Hole or Outdoor Unit Refrigerant Port.

1.1 Draw Main Pipe by clicking Mouse from Riser Hole or Outdoor Unit Refrigerant Port.

1.2 Press Enter, to finish drawing pipe.



- The radius of Pipe bending part can be set in Environment Setting of Main Tab.



2. Pipe connection with Indoor Unit. (Using Smart Wiring)

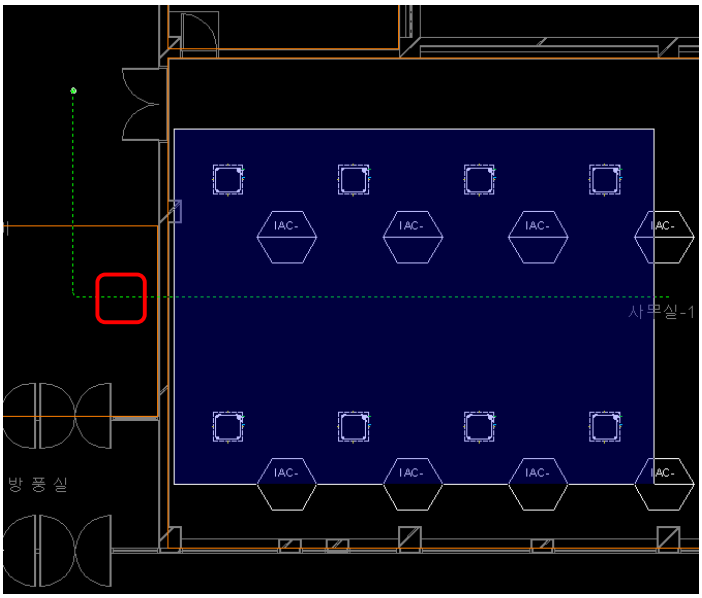
2.1 Select Piping Equipment Menu of Symbol Pane.

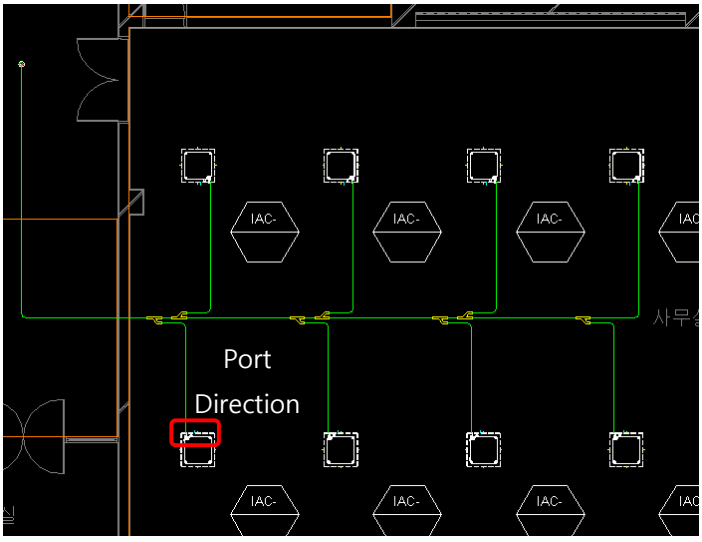
2.2 Input to “S” in command line for Select Smart Wiring.

```
Select connection point or [Smart wiring(S)/ Offset
wiring(O)/ Independent refrigerant pipe(R)/ Independent drain
pipe(D)] :
```

2.3 First select Pipe, and select Indoor Units to connect.

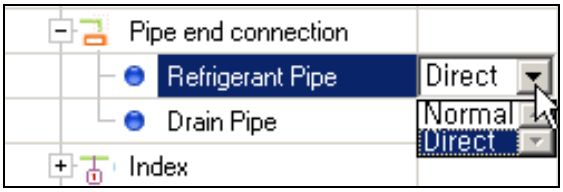
2.4 If you want finish to smart wiring, press Enter.





Caution! It is automatically connected only when Indoor Unit Port is toward Main Pipe or in parallel.

- The last Indoor Unit connection option (Normal connection, direct connection) can be set in Environment Setting.



- Normal: Insert Branching Pipe in Main Pipe to connect Indoor Unit.

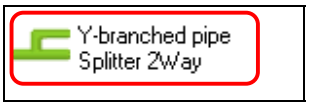
- Direct: Directly connect Indoor Unit without inserting Branching Pipe.

Branching Pipe Connection

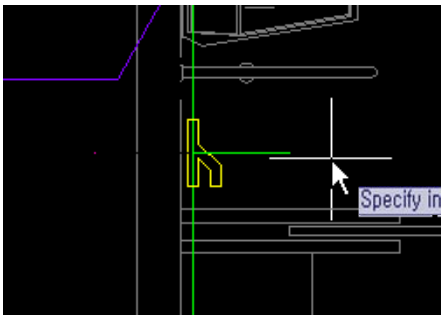
1. Y-branched pipe

Insert Branching Pipe to Main Pipe to connect to Indoor Unit. (It is automatically connected in Smart Connection.)

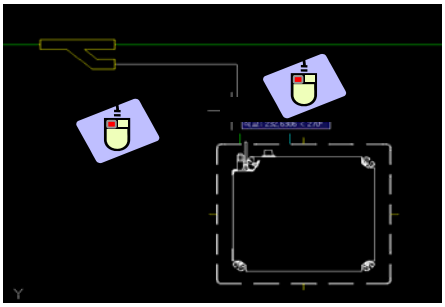
1.1 Double click Y Branching Pipe icon in Pipe Material tab in Symbol Pane.



1.2 Select insertion point of Main Pipe, and select left or right direction.



1.3 After selecting Piping Equipment Menu, draw Refrigerant Pipe from the connection point of Branching Pipe to Indoor Unit Port.



Drain Pipe Connection

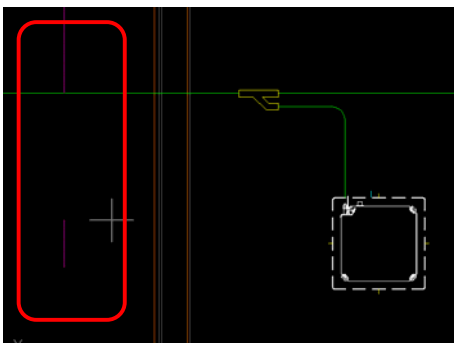
Connect drain Pipe in parallel with Refrigerant Pipe.

1. Select Piping Equipment Menu in Symbol Pane.

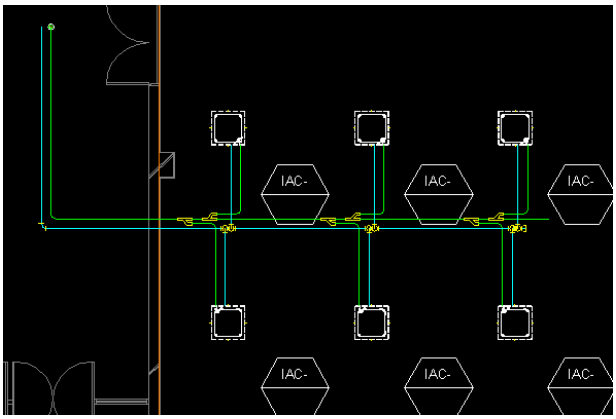
2. Input to "O" in command line for Selecting offset wiring.

```
Select connection point or [Smart wiring(S)/ Offset
wiring(O)/ Independent refrigerant pipe(R)/ Independent drain
pipe(D)] :
```

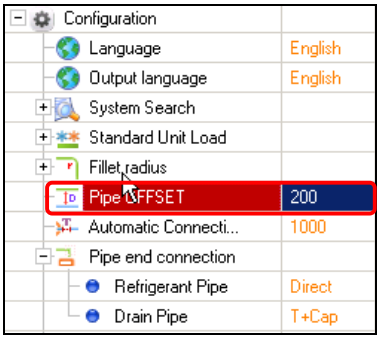
3. After designating parallel path standard Pipe, designate offset direction.



4. Drain Pipe is connected with certain distance offset along Main Pipe.



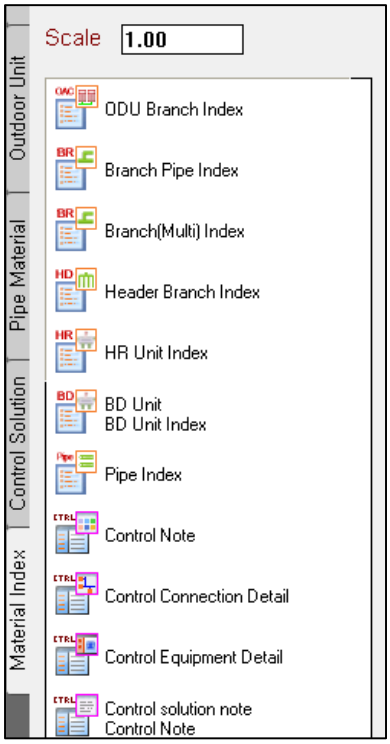
- Offset distance can be designated in Environment Setting of Main Tab.

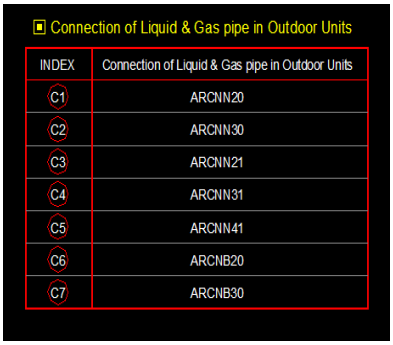


Material Index

The remarks for the Pipe material applied to the drawing may be inserted in Material Index tab in Symbol Pane.

The name of inserted Model is changed according to the language condition setting of Environment Setting in Main Tab.





Connection of Liquid & Gas pipe in Outdoor Units

INDEX	Connection of Liquid & Gas pipe in Outdoor Units
C1	ARCNN20
C2	ARCNN30
C3	ARCNN21
C4	ARCNN31
C5	ARCNN41
C6	ARCNB20
C7	ARCNB30

System Validation Checking

It selects Pipe diameter and Branching Pipe to insert in the drawing, and carries out system efficacy inspection.

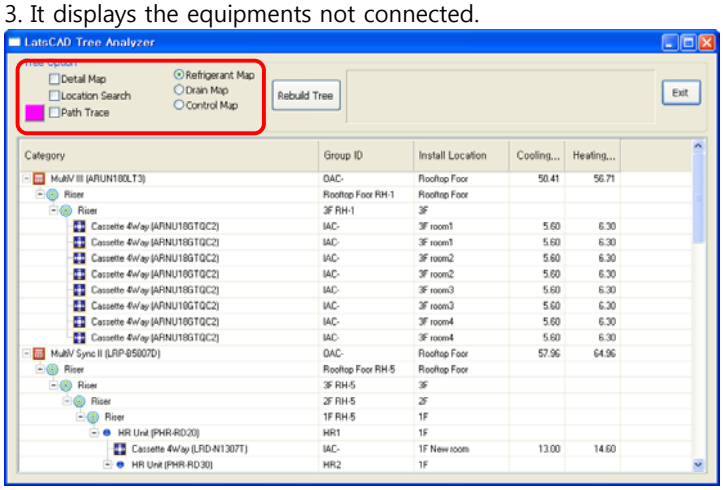
Checking Connect Condition (Drawing Check)

It updates and shows the connection structure currently composed.

1. It searches the location of the selected equipment and displays the connection relations between Indoor Unit – Outdoor Unit through Tree Option Setting.

2. Re-composition is possible for each type of Refrigerant, Drain, and Control.

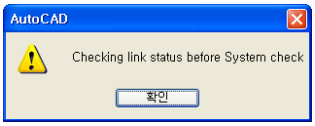
3. It displays the equipments not connected.



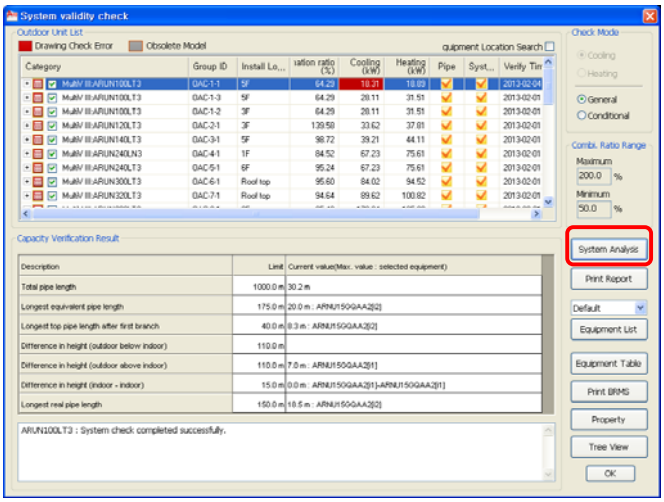
Caution! Please check the Drawing Check function before System Check.

Checking Refrigerant Pipe Validation (System Check)

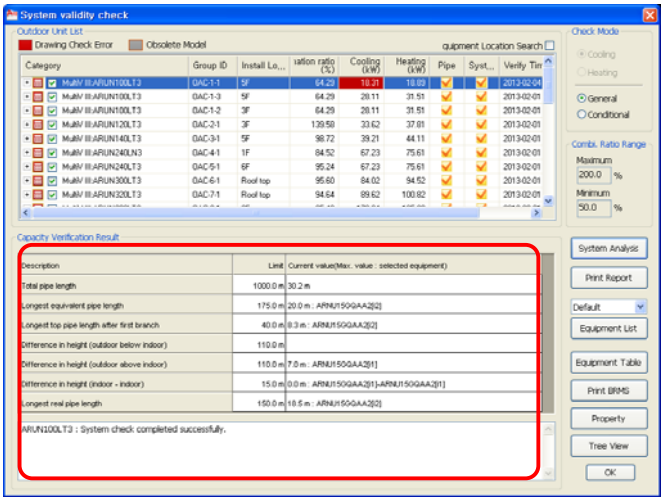
Caution! Check the Checking Connect Conditon function, before using Checking Refrigerant Pipe Validation function.



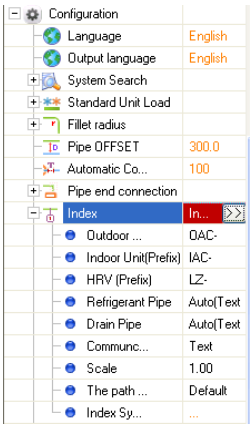
1. System Analysis

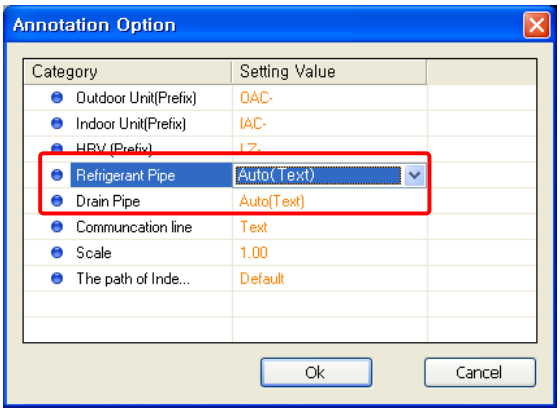


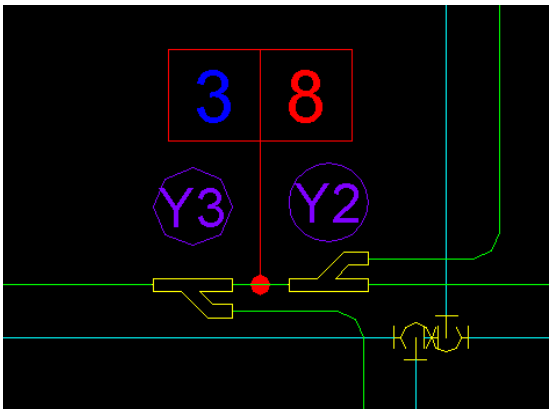
- It shows the system verification result for each equipment.



- When checking Refrigerant pipe & Drain pipe mode “Auto” in Annotation Option, Pipe diameter and Branching Pipe annotations are automatically selected.

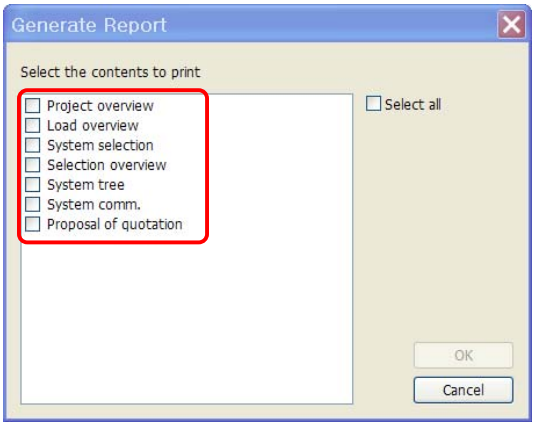






2. Print Report

- After selecting the category for output, it outputs the report. (The output contents are listed for each tab of Excel Sheet.)

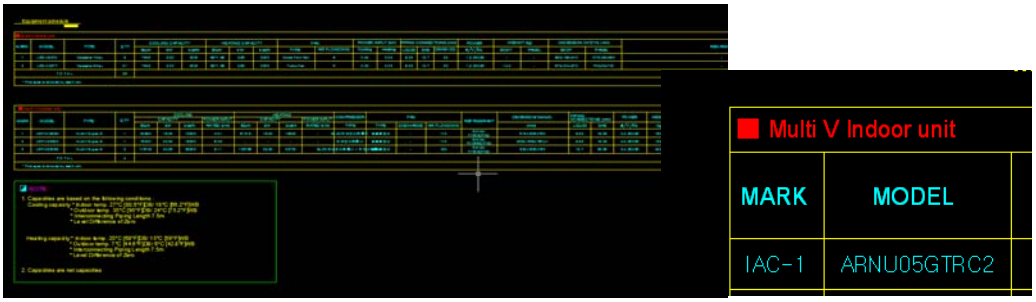


3. Equipment List

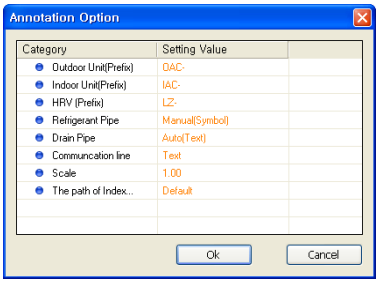
- Select the position to insert List of Equipments in the drawing.

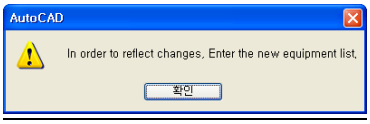
- The contents for equipment and pipe material applied to the drawing are inserted as List of Equipments.

- The mark assigned automatically when insert the Equipment table.



Caution! When change the mark(outdoor unit prefix, indoor unit prefix, and hrv prefix) in the Index, Enter the new equipment list .

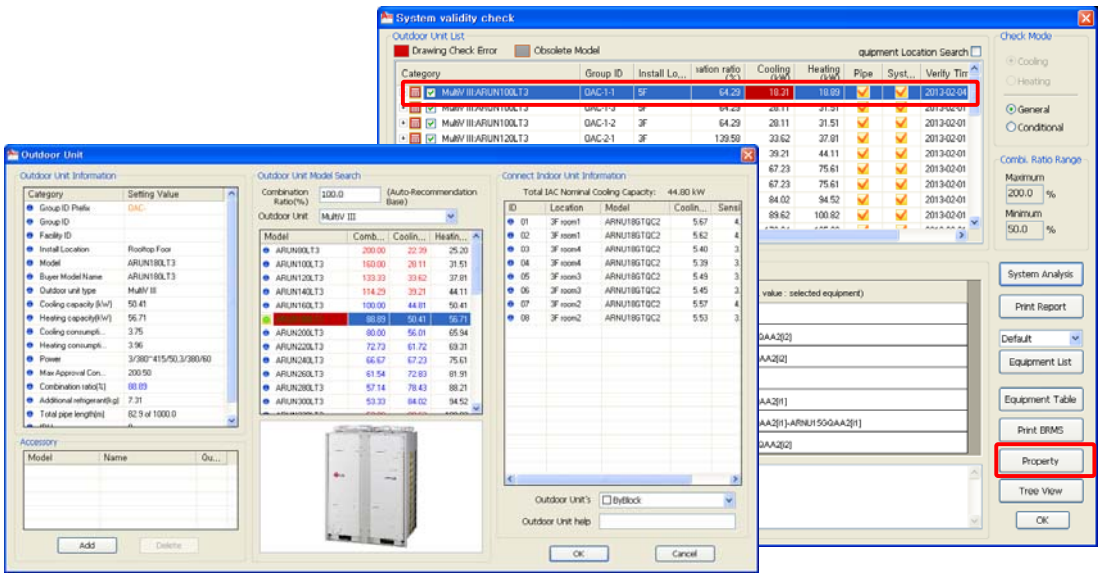




4. Property

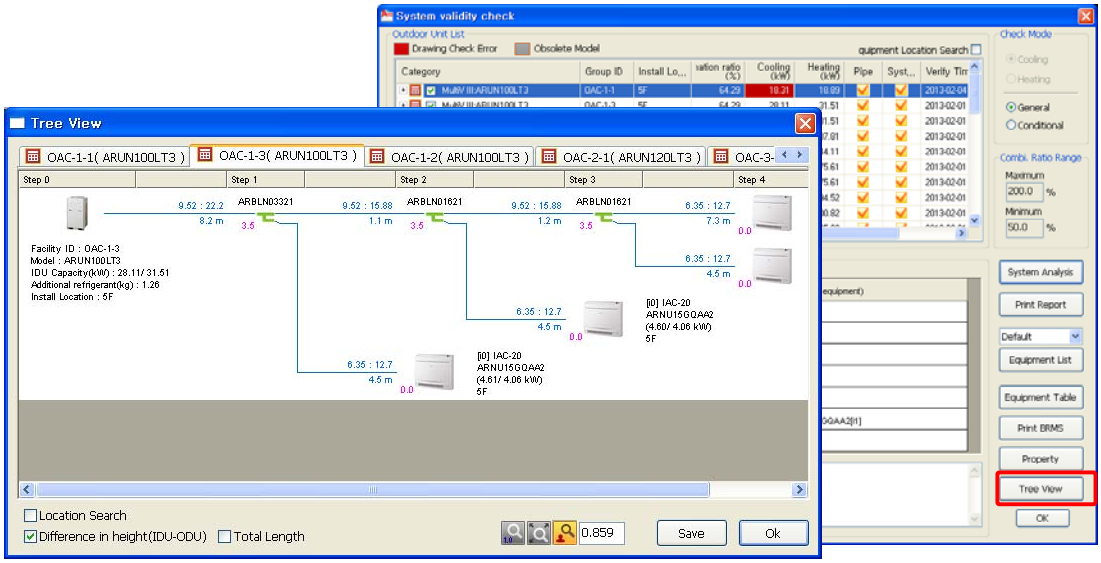
- Verification and changes of property information for the selected equipment are possible.

- While the equipment is selected, select Property Information.

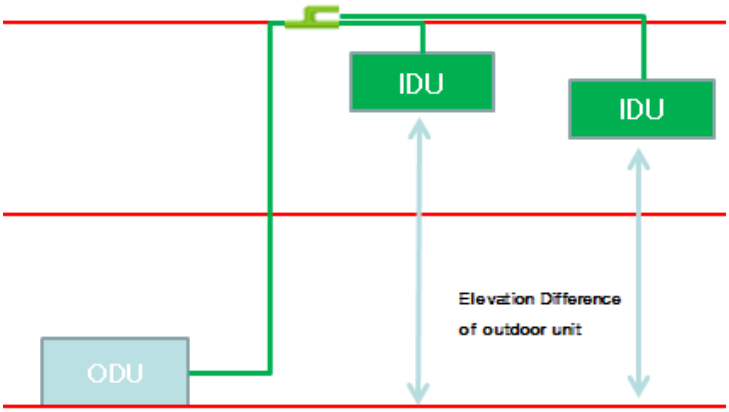


5. Tree View

- Verification and changes of property information for the selected equipment are possible.



Deference in height (IDU-ODU):

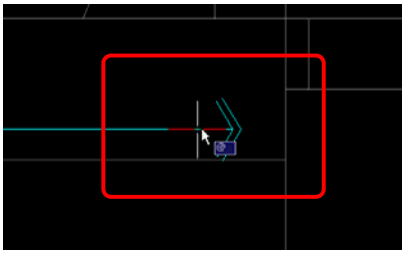


Checking Drain Validation

Check Drain Pipe Diameter.

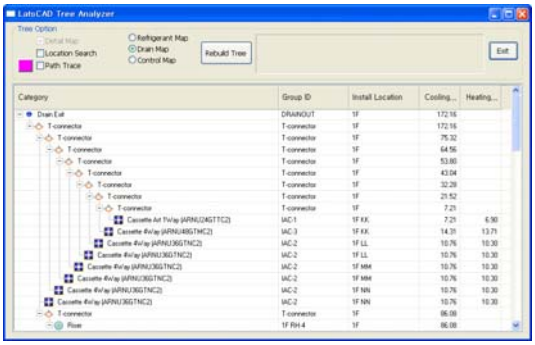
1. Select Drain Exit in Pipe Material in Symbol Pane.

2. After selecting the last exit of Drain Pipe, close the drain exit with “Drain Exit”.

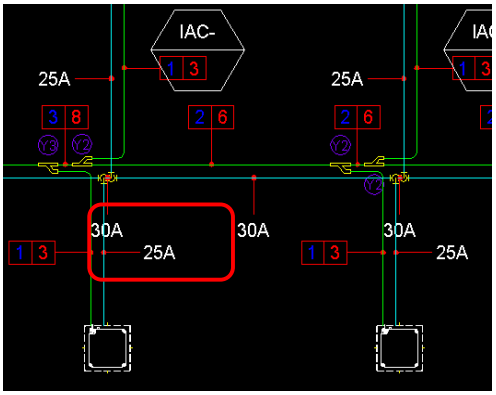


3. Select Checking Drain Validation in Master Pane.

4. It shows Drain Pipe structure from Drain Exit.



5. Drain Pipe Diameter is automatically selected and inserted in the drawing.



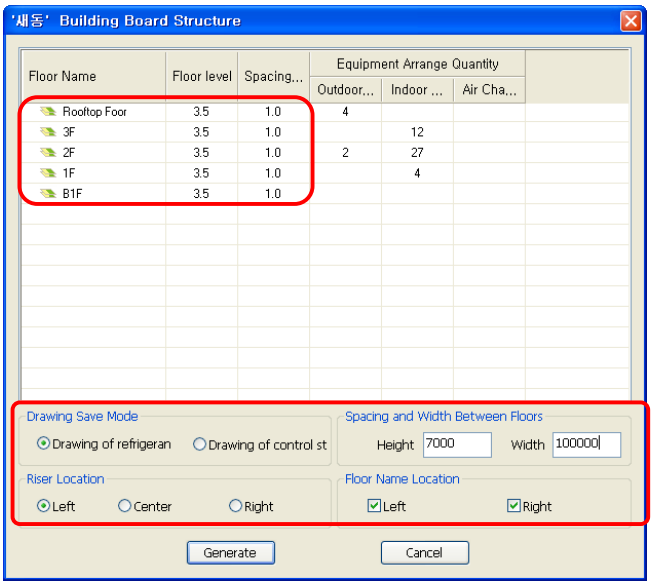
Refrigerant System Diagram Drawing

Building Board Composition

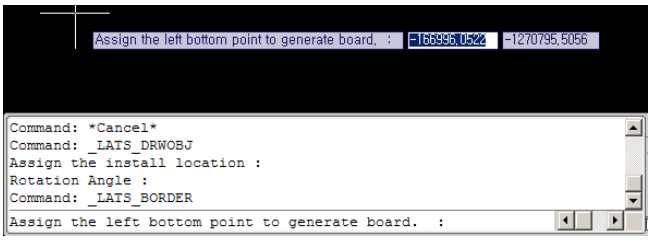
It composes the building board in the drawing of the system diagram before positioning equipment and pipe material.

1. Select “Building Board Composition” in Pull Down Menu (LATSCAD).

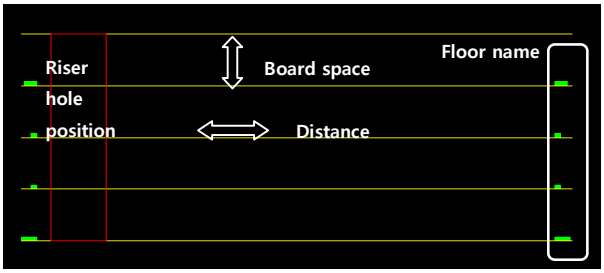
2. Set Building Board Option (Drawing Save Mode, Riser Location, Spacing and Width Between Floors, and Floor Name Location).



2. Select the lower left point to position board in the drawing.


Assign the left bottom point to generate board. : -166996.0522 -1270795.5056
Command: *Cancel*
Command: _LATS_DRWOBJ
Assign the install location :
Rotation Angle :
Command: _LATS_BORDER
Assign the left bottom point to generate board. :

3. Building Board creation is completed to draw system diagram.

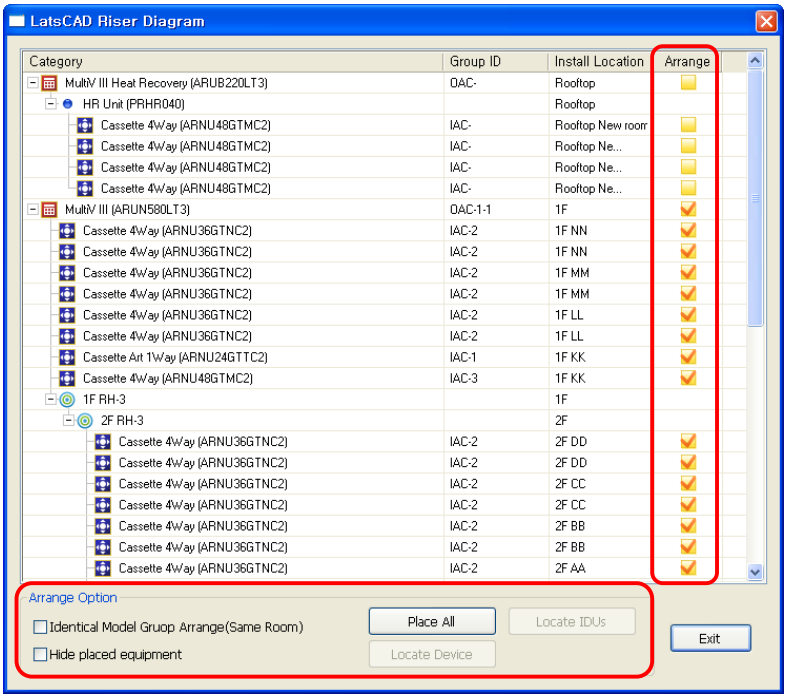


Schematic(Refrigerant) Diagram Equipment Arrangement

It positions the equipments to draw system diagram.

1. Select “LATSCAD → Schematic(Refrigerant) Diagram Equipment Arrangement” in Pull Down Menu.

- When equipments are positioned in Building Board, the equipments are checked Arrange tab of Riser Diagram.



2. Position the equipments. (Select Arrange Option)

2.1 Identical Model Group Arrange (Same Room)

- When “Identical Model Group Arrange (Same Room)” is selected in Arrange Option, Indoor Unit Notes and Positioned Rooms are displayed as a group.

2.2 Hide Placed equipment

- Hide Equipments of placing in Building Board to Riser Diagram. When all Equipments positioned in Building Board, not exist equipment in Riser Diagram.

2.3 Place All

- select "Place All" → All Equipments of Riser Diagram are positioned in Building Board.

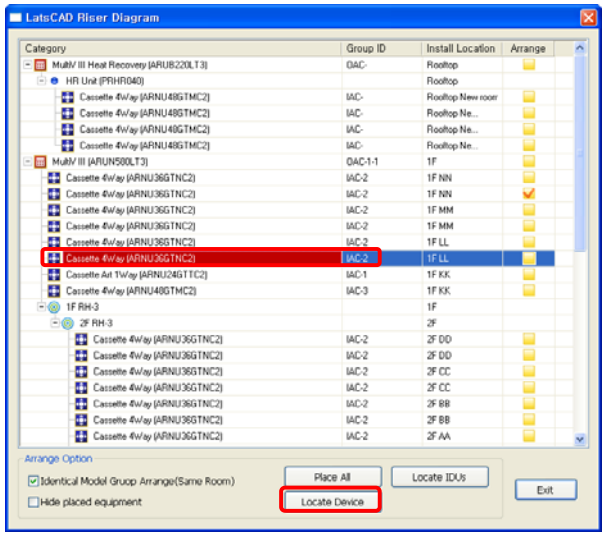
2.4 Locate IDUs

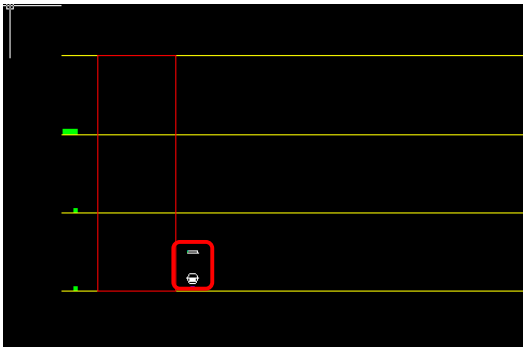
- After selecting Outdoor Unit or Riser in Riser Diagram, select "Locate IDUs" → Indoor Units are positioned in Building Board.

(Indoor Units connected to the selected Outdoor Unit are automatically positioned.)

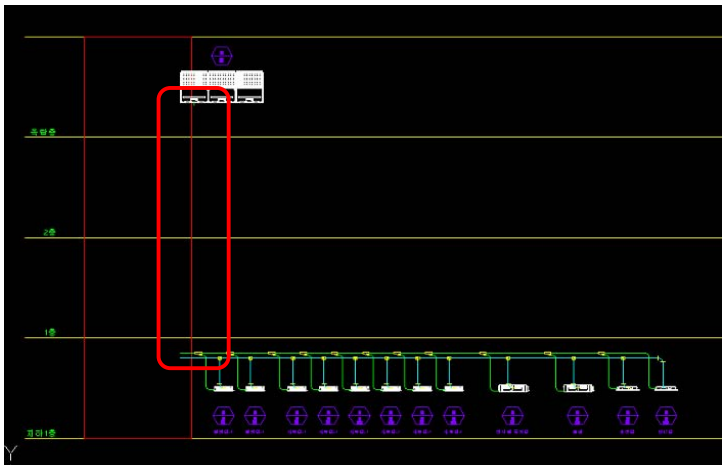
2.5 Locate Device

- After selecting Outdoor Unit or Indoor Unit in Riser Diagram, select "Locate Device" → The selected equipments are positioned in Building Board.





3. The connection between Outdoor Unit-Indoor Unit is manually connected through Piping Equipment.

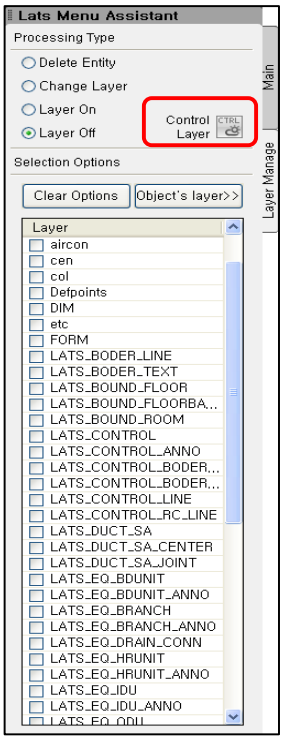


Control Diagram Drawing

Layer Arrangement

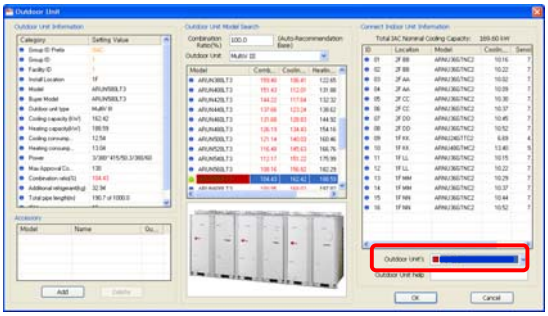
It rearranges Layer for Control design.

1. Select Layer Manage Tab in Master Pane.
2. Select Control Layer Menu to Off the Layers for Refrigerant/Drain pipes unnecessary for the design of Control.



Outdoor Unit Property Information Change

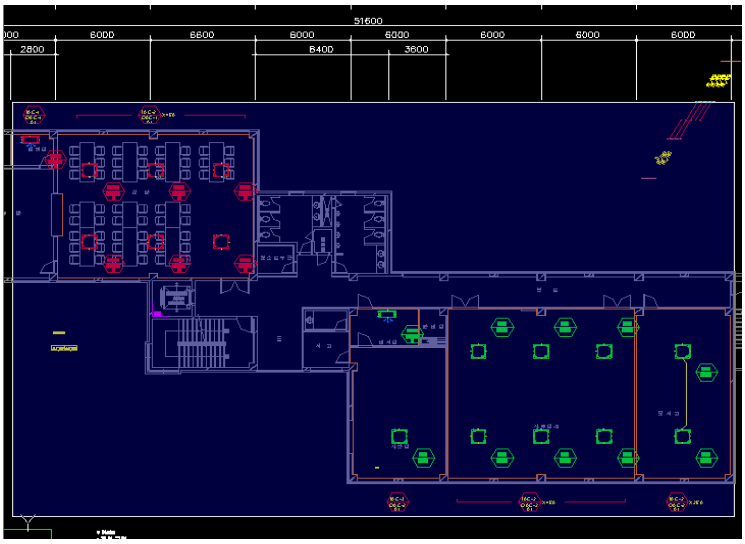
Change the color of Indoor Units connected to the same Outdoor Unit through Outdoor Unit Property Information (Color Change).

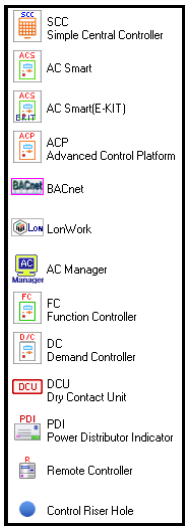


Controller Positioning

1. Select desired Controller in Control Solution Tab in Symbol Pane.

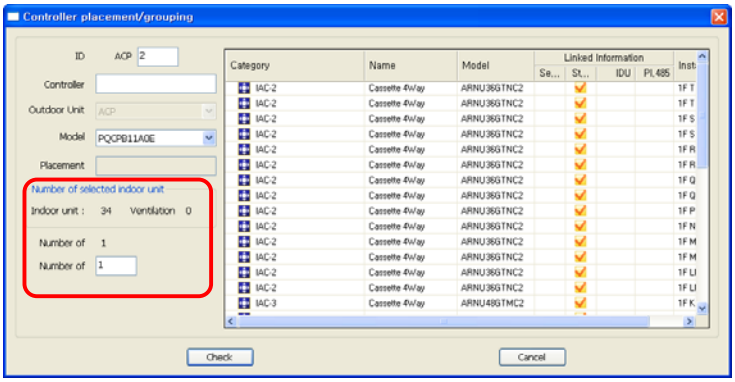
2. Calculate the minimum number of Controllers by selecting Indoor Unit (or ventilation) to connect when inserting in the drawing.



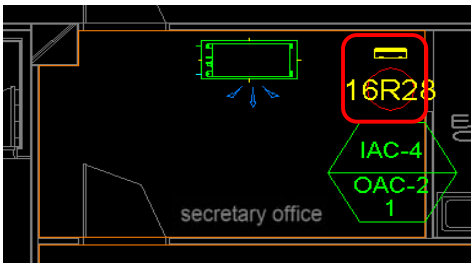


2.1 The minimum number is selected with the consideration for the number of Indoor Units (or ventilation) connected to each selected Controller.

2.2 Set the minimum number of selected Controllers or the higher number desired to position in the drawing.



3. Position the calculated minimum number or higher number of Controllers in the drawing.



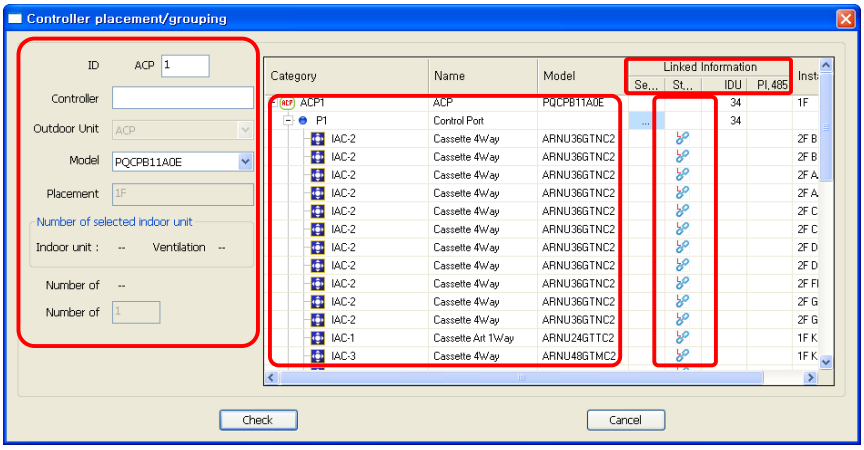
4. Compose the logic by selecting Indoor Unit (or ventilation) to be connected to each positioned Controller.

4.1 Select Control Logic Configuration Menu.

4.2 Select positioned Controller.

4.3 Set Control name and Controller Model.

4.4 Select Indoor Unit (or ventilation) to be connected through the selected category in the drawing.



4.5 The logical connection between the corresponding Controller and the selected Indoor Units is composed.

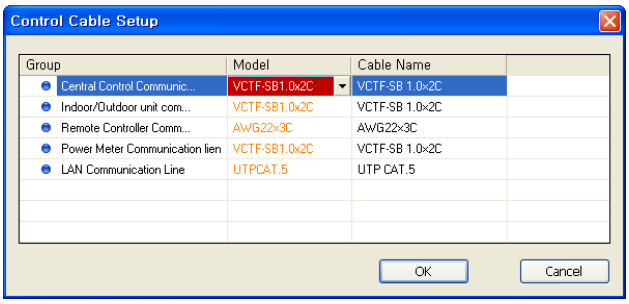
4.6 When the communication line is connected to the corresponding Controller and the selected Indoor Units and Outdoor Units, the icon is changed to physical connection.

Caution! Error occurs when it exceeds the maximum number of Indoor Unit (or ventilation) connections for each Controller.

Caution! When an Indoor Unit (or ventilation) connected to a different Controller is selected, a message for re-composition of the logical connection is displayed.

Control Cable Model Setting

It sets Cable Model for each Control communication line.



Control Wiring

It connects Control line between Control Ports. (only exists in Control Solution Tab)

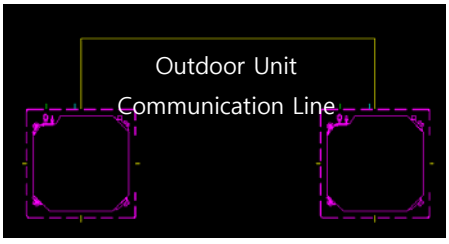
1. Select the Control Wiring Menu.

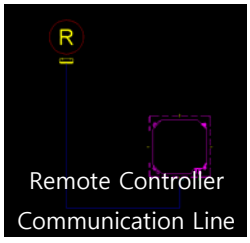
2. Select the Control Port to connect manually, or connect automatically through Smart Connection.

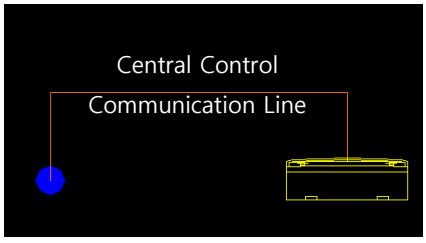
2.1 Manual Connection

- Select Control Riser Hole or Control Port to connect.

- After the connection, remaining Control Ports cannot be used.





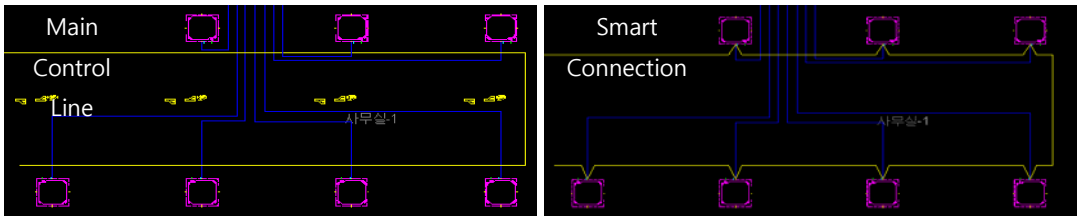


2.2 Automatic Connection (Smart Connection) after drawing Main Control Line

2.2.1 Draw Main Control Line based on the equipments to connect to.

2.2.2 Select Smart Cabling in Control Cabling Option.

2.2.3 After drawing Main Control Line, select Indoor Units to connect to.



2.3 Chain Wiring (O)

2.3.1 Select Chain Cabling in Control Cabling Option.

2.3.2 Select Indoor Unit (or ventilation) to connect to. (It is cabled according to the order of selection.)

2.3.3 Set the direction of Cabling.

2.4 Remote Controller Offset Connection (O)

2.4.1 Manually connect the base Remote Controller Communication Line.

2.4.2 Select Unit (or ventilation) to connect.

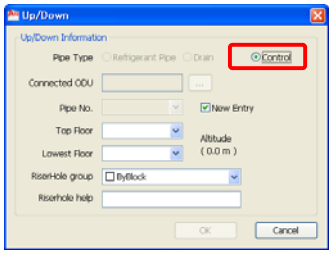
2.4.3 Select Remote Controllers according to the connection order of Indoor Unit (or ventilation).

2.4.4 Indoor Unit (or ventilation) and Remote Controller are automatically cabled with certain distance offset.

Caution! The remaining Control Ports other than the Control Port of the connected Indoor Unit (or ventilation) cannot be used. First connect the Remote Controller Communication Line and then connect the communication lines of the Indoor and Outdoor Units to display the same connection angles.

4. Control Riser Hole Positioning

4.1 Select Control Riser Hole in Control Solution tab in Symbol Menu.



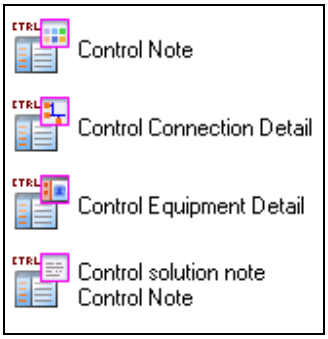
4.2 After setting Floor Information, position in the desired location.

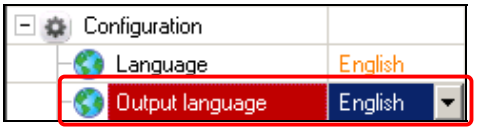
4.3 The types of the Control Lines starting from Control Riser Hole are decided by the type of the connected equipment (Control, Indoor Unit, Outdoor Unit, ventilation).

Control Remarks

Remarks for Control equipments applied to the drawing can be inserted in Material Remarks tab in Symbol Pane.

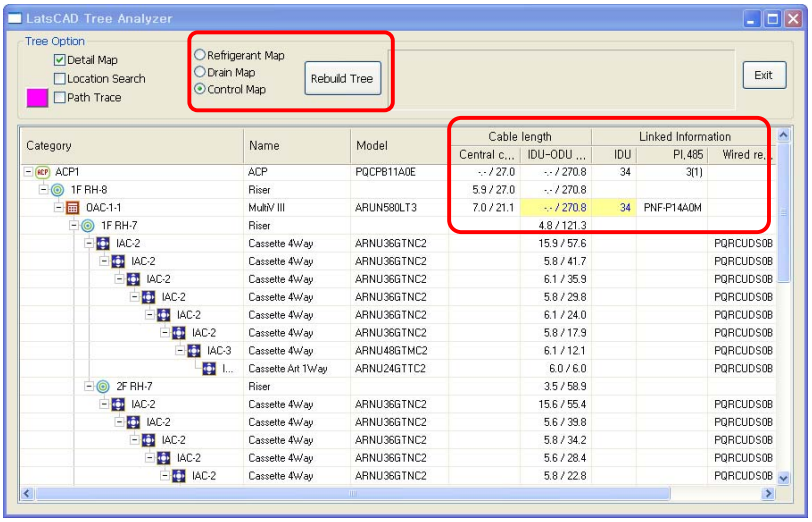
The name of the Model inserted is changed according to output language setting of Environment Setting in Master Menu.





Checking Communication line Validation

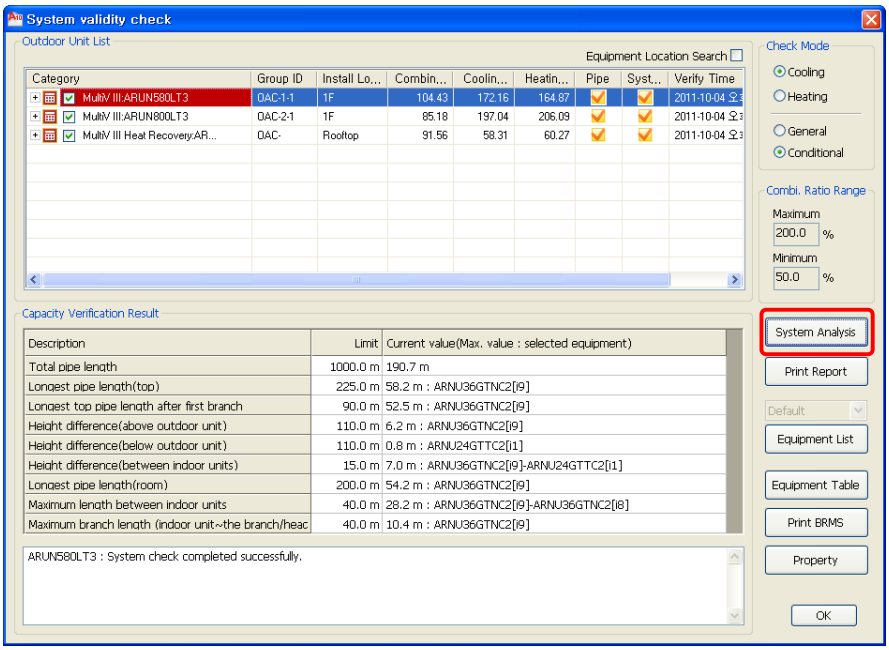
1. Select Checking Communication line Validation.
2. The connection relations of Controller and Indoor/Outdoor Units physically connected are defined based on the central Control line.
3. Cable length, the number of connected Indoor Units, and the number of PI485 Points are verified.

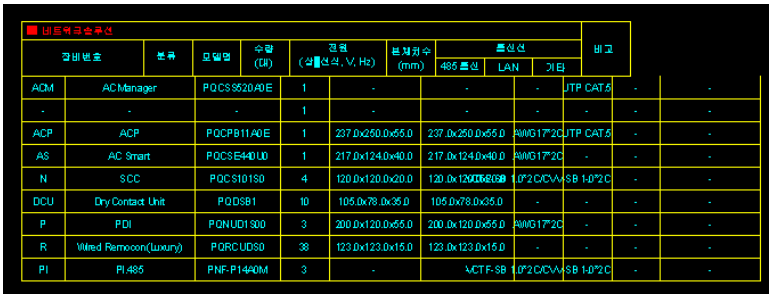

LatsCAD Tree Analyzer
Tree Option
Detail Map
Location Search
Path Trace
Refrigerant Map
Drain Map
Control Map
Rebuild Tree
Exit
Category
Name
Model
Cable length
Central c...
IDU-ODU ...
Linked Information
IDU
PI.485
Wired re...
ACP1 ACP PQCPB11A0E -.- / 27.0 -.- / 270.8 34 3(1)
1F RH-8 Riser 5.9 / 27.0 -.- / 270.8
OAC-1-1 MultiV III ARUN580LT3 7.0 / 21.1 -.- / 270.8 34 PNF-P14A0M
1F RH-7 Riser 4.8 / 121.3
IAC-2 Cassette 4Way ARNU36GTNC2 15.9 / 57.6 PQRCUDS0B
IAC-2 Cassette 4Way ARNU36GTNC2 5.8 / 41.7 PQRCUDS0B
IAC-2 Cassette 4Way ARNU36GTNC2 6.1 / 35.9 PQRCUDS0B
IAC-2 Cassette 4Way ARNU36GTNC2 5.8 / 29.8 PQRCUDS0B
IAC-2 Cassette 4Way ARNU36GTNC2 6.1 / 24.0 PQRCUDS0B
IAC-2 Cassette 4Way ARNU36GTNC2 5.8 / 17.9 PQRCUDS0B
IAC-3 Cassette 4Way ARNU48GTMC2 6.1 / 12.1 PQRCUDS0B
I... Cassette Art 1Way ARNU24GTTC2 6.0 / 6.0 PQRCUDS0B
2F RH-7 Riser 3.5 / 58.9
IAC-2 Cassette 4Way ARNU36GTNC2 15.6 / 55.4 PQRCUDS0B
IAC-2 Cassette 4Way ARNU36GTNC2 5.6 / 39.8 PQRCUDS0B
IAC-2 Cassette 4Way ARNU36GTNC2 5.8 / 34.2 PQRCUDS0B
IAC-2 Cassette 4Way ARNU36GTNC2 5.6 / 28.4 PQRCUDS0B
IAC-2 Cassette 4Way ARNU36GTNC2 5.8 / 22.8 PQRCUDS0B

List of Control Equipment

1. Select Checking Refrigerant Pipe Validation.

2. Select the Equipment List. (List of Control Equipment is added to the existing Equipment List.)





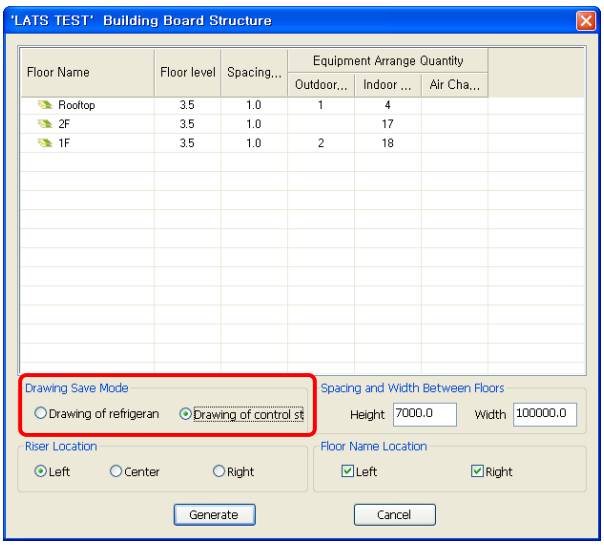
Schematic(Control) Diagram Equipment Arrangement

Draw Control System Diagram based on the positioned Controller and Control Communication Lines.

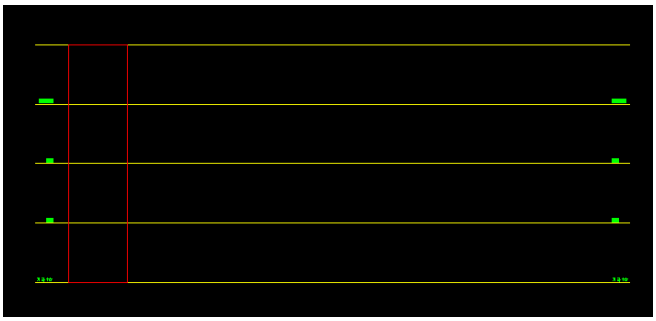
1. Building Board Composition

1.1 Select Building Board in Pull Down Menu (LGE LATSCAD).

1.2 Select "Drawing of Control st" in the Drawing Save Mode to create Building Board.



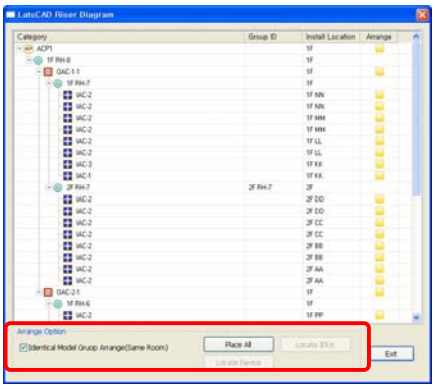
1.3 Designate lower left point in the drawing to insert Building Board.



2. Control System Diagram Equipment Positioning

2.1 Select Schematic(Control) Diagram Equipment Arrangement in Pull Down Menu(LGE LATSCAD).

2.2 Select Arrange Option.



2.2.1 Identical Model Group Arrange (Same Room)

- When "Identical Model Group Arrange (Same Room)" is selected in Arrange Option, Indoor Unit Notes and Positioned Rooms are displayed as a group.

2.2.2 Place All

- select "Place All" → All Equipments of Riser Diagram are positioned in Building Board.

2.2.3 Locate IDUs

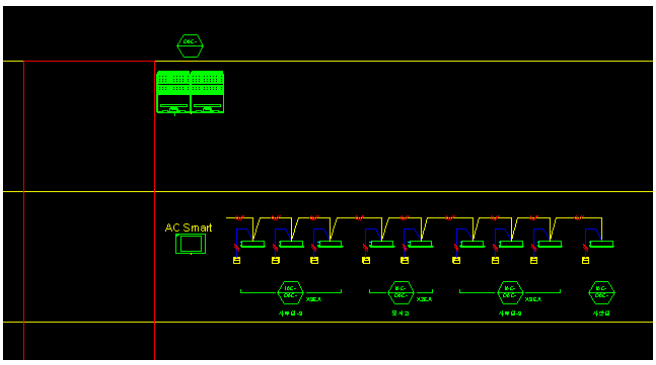
- After selecting Outdoor Unit or Riser in Riser Diagram, select "Locate IDUs" → equipments of Indoor Units are positioned in Building Board.

(Indoor Units connected to the selected Outdoor Unit are automatically positioned.)

2.2.4 Locate Device

- After selecting Outdoor Unit or Indoor Unit in Riser Diagram, select "Locate Device" → The selected equipments are positioned in Building Board.

2.5 Select Control Wiring Menu of Control Solution Tab to connect Indoor/Outdoor Unit Communication Lines and Central Control Communication Line.



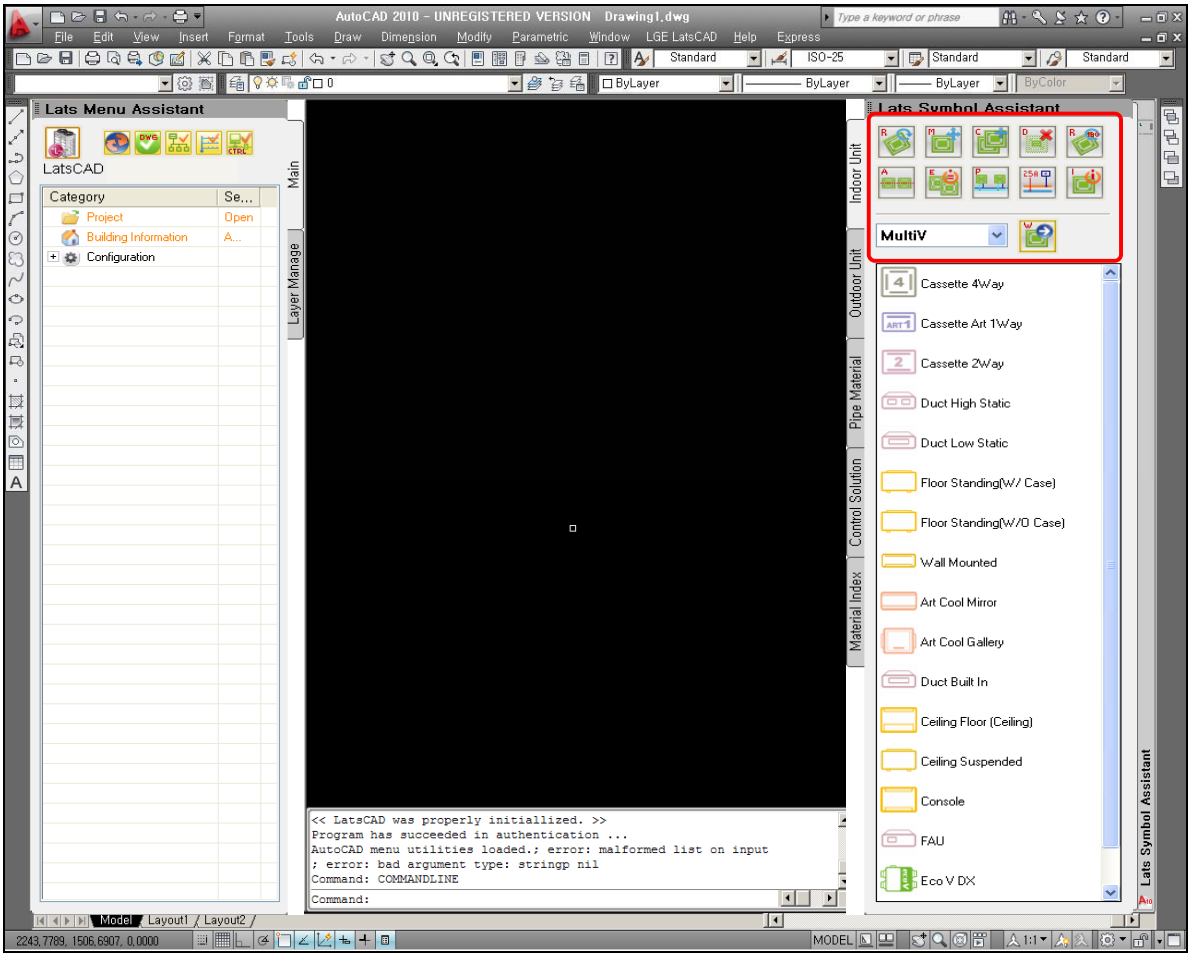
Function Description for Each Menu

It describes which operations are done in the functions in each Menu, and it is the explanation page based on the conditions and the exceptional cases to use the functions.

Equipment Editing

Editing of Indoor Unit, Outdoor Unit, and Pipe Material, and Control Solution, and Material Index Positioning of Pipe Notes can be done. Multiple equipment selection is included in all the Menu.

Caution! You can not use UNDO function in LATS CAD Menu. And If you use UNDO function of Auto CAD, check Refresh Drawing Menu for initialization.



Rotate Equipment

It can rotate the positioned equipment based on the central point.

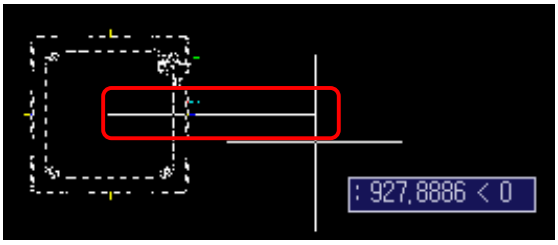
1. Select Rotate equipment menu ( ).

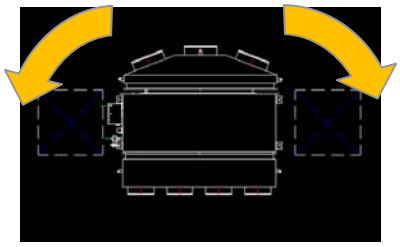
2. Select the object to rotate in the drawing, press Enter.

3. Input rotation direction or rotation value.

3.1 You may rotate by selecting the direction to rotate.

- 3 o'clock direction is 0 degree.
- For multiple selections, they rotate individually based on the center of each object.
- For fixed pressure Duct, the equipment and the chamber rotate the same.





3.2 You may also rotate the equipment by the input of desired angle. (Input angle in the command input line)

Move Equipment

It moves Equipment and Pipe Material from the base point to the selected point.

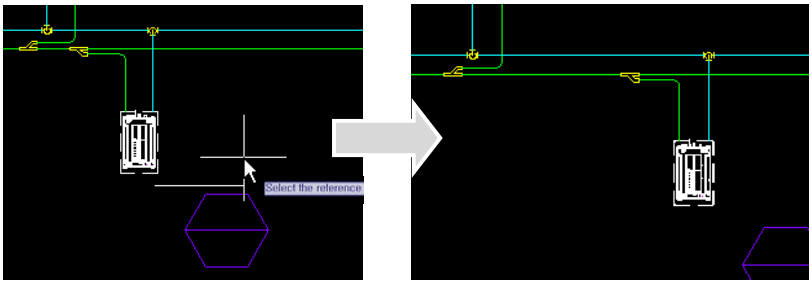
1. Select Move Equipment menu ( ).

2. Select the object to move in the drawing, and press Enter.

3. Select or input Move Equipment base point.

4. Select or input Move Equipment moving point.

- It moves maintaining the connection relations.



Copy Equipment

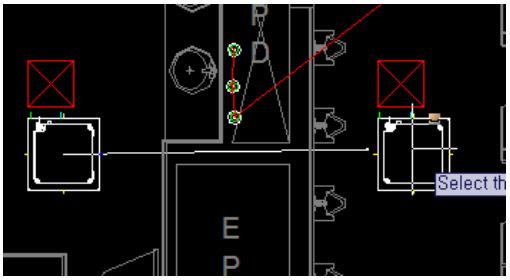
It copies equipment and Pipe Material to the selected point.

1. Select Copy Equipment menu ( ).

2. Select object to copy in the drawing or input Copy Option in the command line.

2.1 Select object to copy in the drawing.

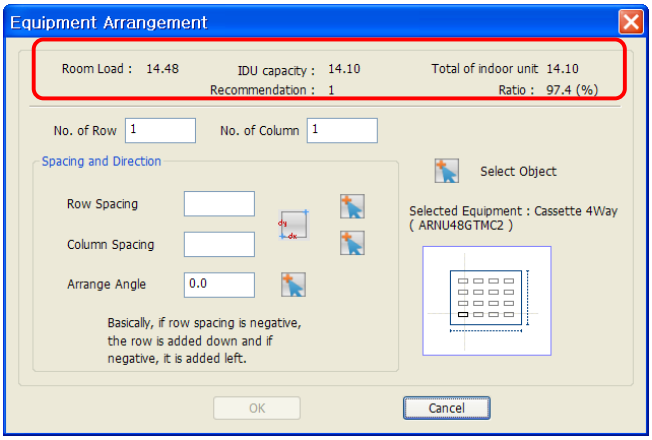
2.1.1 After executing the Menu, when the equipment to copy is selected, the copy of the equipment is immediately possible. Press Enter to finish.



2.1.2 Arrangement (A): After selecting the equipment to copy, input "A" in the command line for Arrangement.

```
Select the copy point[ Arrangement(A)/ Change reference point(B) ] :
```

- Only when the equipment to copy is Indoor Unit, the recommended number is calculated based on the area where the corresponding Indoor Unit is located.


Equipment Arrangement
Room Load : 14.48
IDU capacity : 14.10
Recommendation : 1
Total of indoor unit 14.10
Ratio : 97.4 (%)
No. of Row 1
No. of Column 1
Spacing and Direction
Row Spacing
Column Spacing
Arrange Angle 0.0
Basically, if row spacing is negative, the row is added down and if negative, it is added left.
Select Object
Selected Equipment : Cassette 4Way (ARNU48GTMC2)
OK
Cancel

- No. of Row: Input number of copying positions in the vertical direction

- No. of Column: Input number of copying positions in the horizontal direction

- Row Spacing: Input gap between row copy positions. If a negative number is input, it copies in the downward direction (or input with the selection of Mouse button)

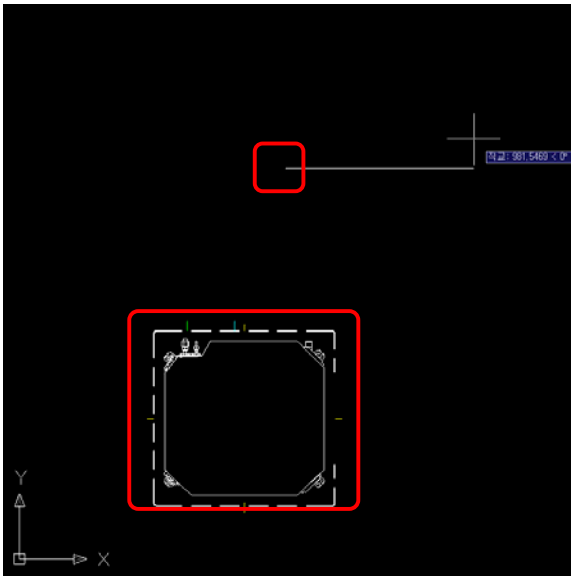
- Column Spacing: Input gap between column copy positions. If a negative number is input, it copies in the left direction (or input with the selection of Mouse button)

- Arrange Angle: Input copy angle. It copies to upper right direction with the default condition (0 degree)

2.1.3 Change Reference Point (B): After selecting the equipment to copy, input "B" in the command line for Chang Reference Point

- The Reference Point can be changed from the Reference Point of the equipment to be copied to the desired position

- After changing the Reference Point, execute Copy



2.2. After executing Copy Equipment Menu, select Copy Option in the command line

```
Select the drawing element to copy and arrange [Multiple
Copy[M]/ Floor Copy(F)/ Room Copy(R) ] :
```

2.2.1 Multiple Copy (M)

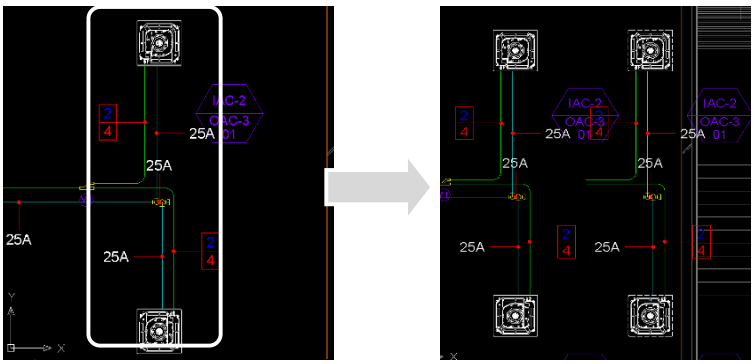
- After selecting Copy Equipment Menu, input "M" in the command line for Multiple Copy.

- Select equipment and material to copy, and press Enter to finish selecting.

- Select the reference point, click the position of copy.

- The copy of the equipment is immediately possible. Press Enter to finish.

```
Select the reference point. :
```



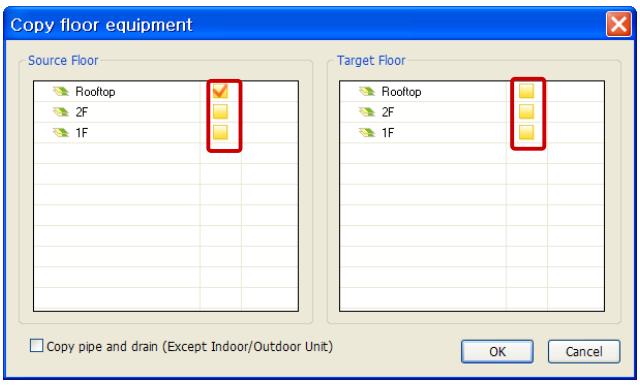
2.2.2 Floor Copy (F)

- After selecting Copy Equipment Menu, input "F" in the command line for Floor Copy.

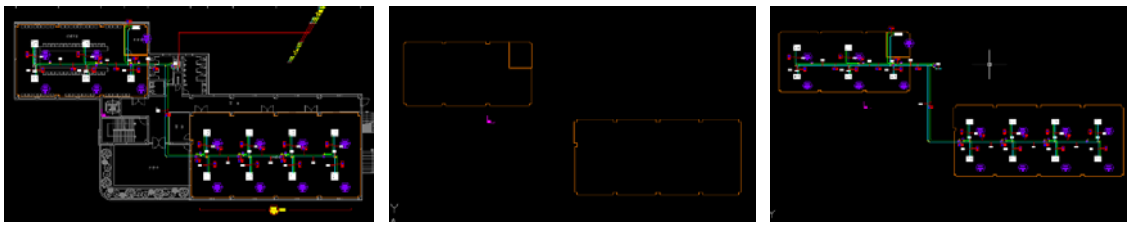
- Select Source Floor and Target Floor.

- Equipment and Pipe Information are copied exactly. (Reference Point for Copy is the reference point of the Floor.)

Caution! Floor Copy can not copy Room Area.



Example) For the 1st and 3rd floor with the same drawing, equipment positioning, and Pipe connection, design only the 1st floor and execute Floor Copy.



Example) 1st Floor

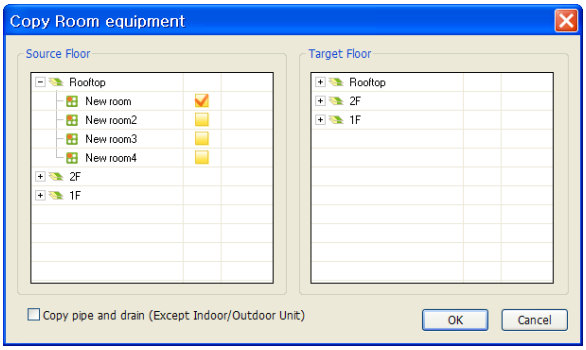
Example) 3rd Floor before/after

2.2.3 Room Copy (R)

- It copies Equipment and Pipe Information in the certain Room.

- After selecting Copy Equipment Menu, input "R" in the command line for Room Copy.

- Select the Source Room of Floor and the Target Room of Floor.



- Copy the equipments in the Source Room of Floor to the Target Room of Floor. (The base point for Copy is the lower left of the Room Area.)

- The Equipment and Pipe Information are copied exactly.

- Check "Copy pipe and drain(Except Indoor/Outdoor Unit)", to copy only pipe and drain.

Caution! Room Copy can not copy Room Area.

Delete Equipment

It deletes Equipment and Pipe Material.

Caution! If AutoCAD delete function is used, Equipment Information remains, so it must be deleted with the above function. After deleting with AutoCAD, to recover LATS function, the drawing must be reopened or Drawing Refresh ( ) function must be carried out to initialize the drawing.

1. Select Delete Equipment Menu ( ).

2. Select the object to delete in the drawing, and press Enter to finish.

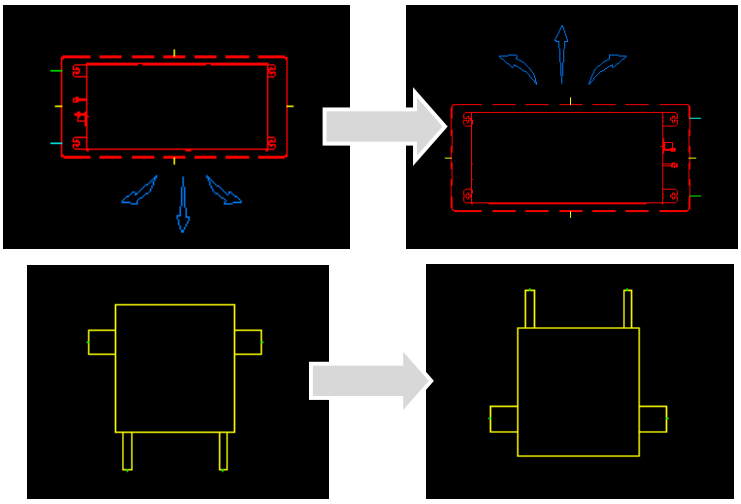
Rotate Equipment (180)

It rotates the selected Equipment or Pipe Material by 180°.

1. Select Rotate Equipment (180) Menu ( ).

2. Select the object to rotate in the drawing, and press Enter to finish.

Caution! Indoor unit and Outdoor unit is rotate 180, but Pipe Material is mirroring.



Equipment Line Up

It arranges the selected equipments vertically or horizontally according to the base equipment.

1. Select Equipment Line Up Menu ( ).

2. Select the objects to arrange in the drawing, and press Enter.

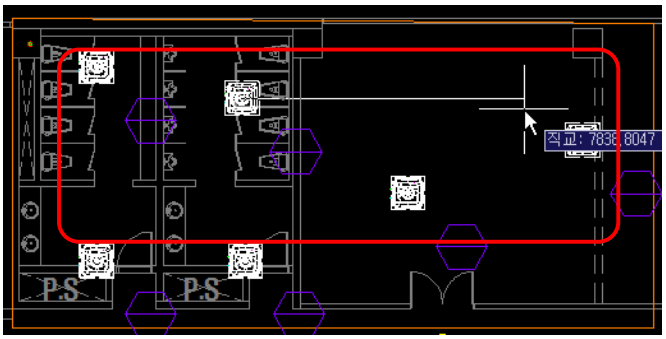
3. Execute basic arrange or select Arrange Option (Uniform Positioning).

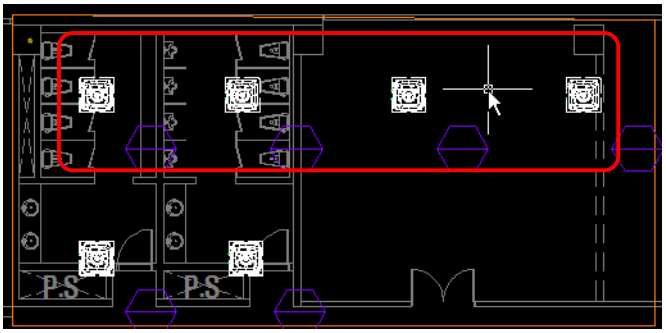
   3.1 Basic Arrange

   - Designate Arrange direction. (The equipments are arranged when vertical or horizontal direction is selected.)

   - When the equipment Click the first selected equipment becomes the base equipment for arrange.

   - When select equipments by drag, at first select the base equipment, and then drag other equipment to arrange.



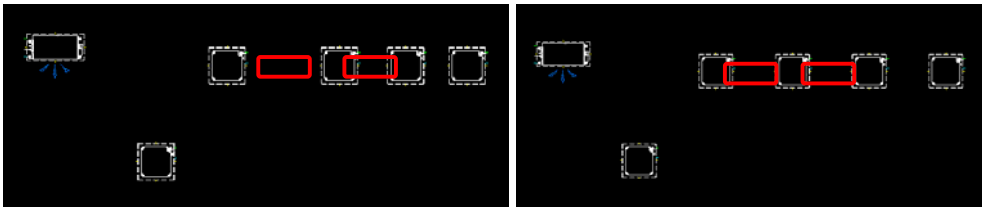


3.2. Select Arrange Option (Uniform Positioning)

- Select Arrange Option. (Equal X-axis or Equal Y-axis)

```
Select objects:
Assign the direction[ Equal X-axis (X)/ Equal Y-axis(Y) ] :
```

- Only the gaps between the selected equipments are positioned uniformly in the directions of X/Y axis.



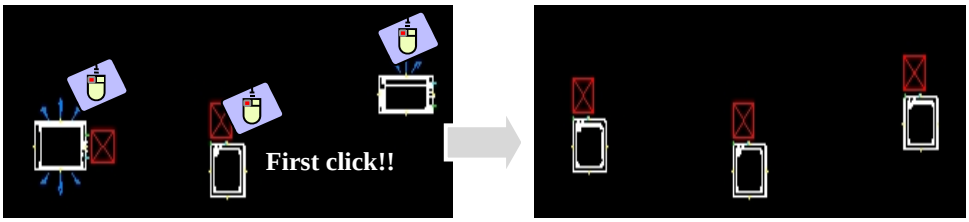
Match Symbol Feature and Equipment Property

It synchronizes the Property Information of the selected Equipments.

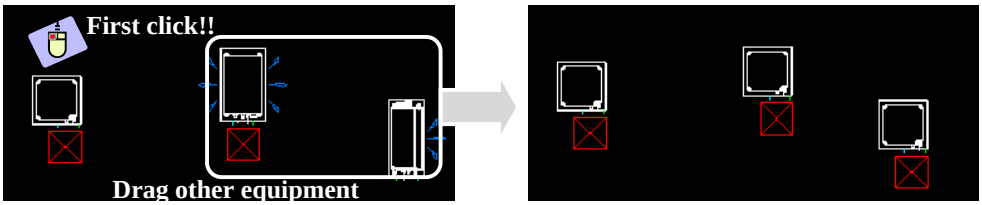
1. Select Match Symbol Feature and Equipment Property Menu ( ).

2. Select the objects to synchronize in the drawing.

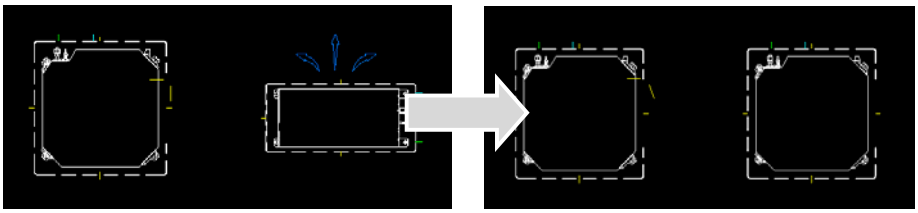
   2.1 When select equipments by click, the first selected equipment becomes the base equipment to synchronize. (Multiple equipments may be selected)



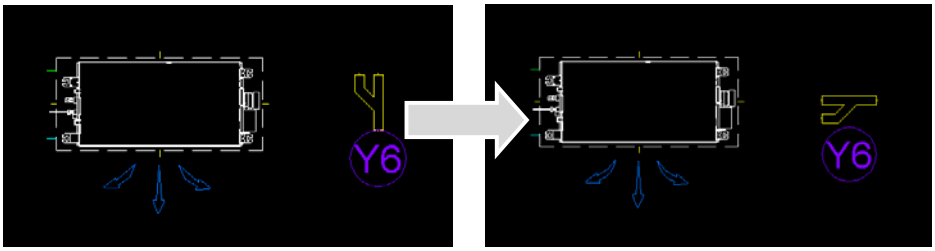
   2.2 When select equipments by drag, at first select the base equipment, and then drag other equipment to synchronize.



   2.3 It synchronizes all of positioning directions and Property Information of the Equipment.



Caution! When other types of symbols are selected, only the positioning direction and the scale are the same.



Piping Equipment

Piping for Refrigerant/Drain Pipe can be done based on the Port of the Equipment.

1. Select Piping Equipment Menu ( ).

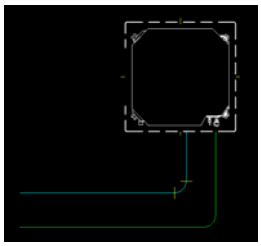
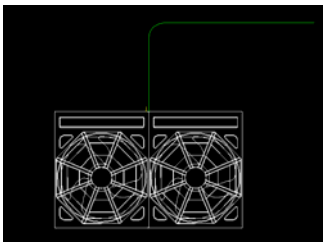
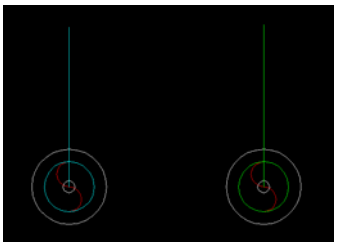
2. Select Port for Manual Piping, or select a Piping Option.

2.1 Manual Piping

2.1.1 After executing Menu, start the connection from Port. (Designate the path for Piping)

2.1.2 It connects from Indoor Unit, Outdoor Unit Port, and Riser Hole.

(It is decided as Refrigerant Pipe or Drain Pipe according to the types of Port and Riser Hole.)

2.2 Select Piping Option (Automatic Piping)

- After executing Menu, you can draw piping using Automatic Piping functions like Smart wiring (S), Offset wiring (O), Independent refrigerant pipe (R), and Independent drain pipe (D)

- Draw Main Pipe for Automatic Piping. (Manually draw by designating the path to Refrigerant Pipe as Main Pipe)

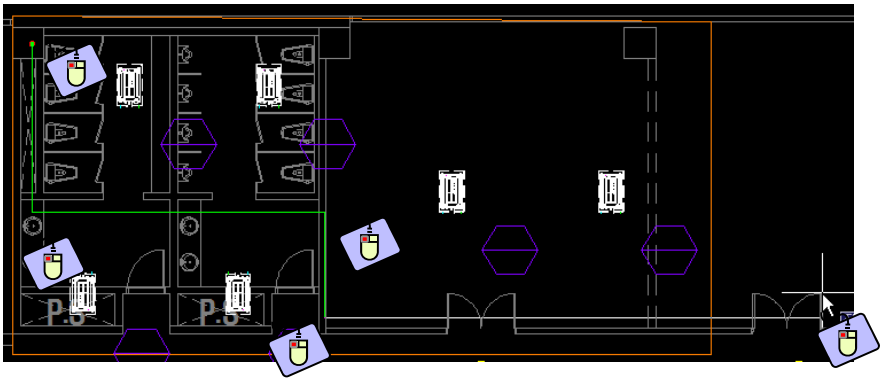
2.2.1 Smart wiring [S]

- Smart piping is possible connecting automatically Main pipe to Indoor Units.

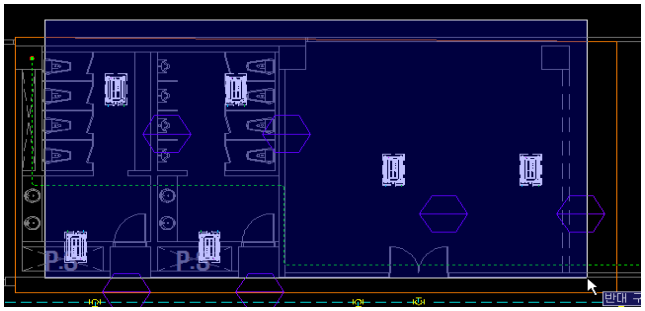
- After executing Menu, input the "S" for Smart wiring in the Command line

```
Select connection point or [Smart wiring(S)/ Offset wiring(O)/
Independent refrigerant pipe(R)/ Independent drain pipe(D)] :
```

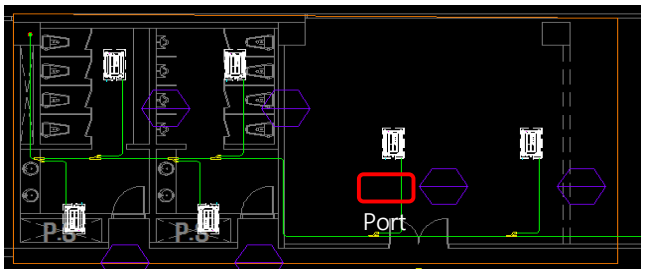
- Draw Main Pipe for Automatic Piping. (Manually draw by designating the path to Refrigerant Pipe as Main Pipe)



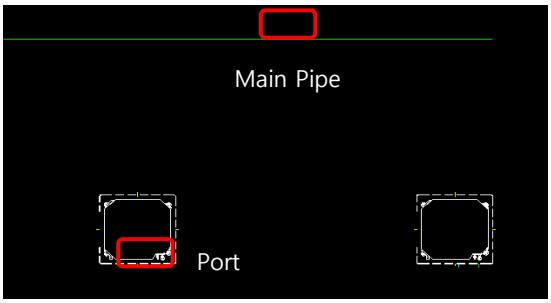
- After selecting Main Pipe for Piping, select the equipment for Smart wiring. (After selecting the Refrigerant Pipe drawn as Main Pipe, select the equipment to connect.)



- Automatically connect the selected Pipe and the Equipment (Automatic creation of Branching Pipe)

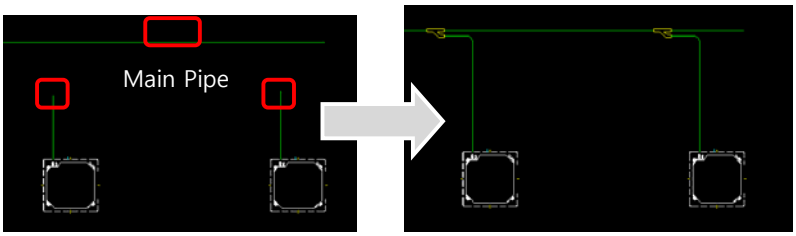


Caution! Automatic Connection is possible only when the Port of Indoor Unit is toward Main Pipe or in parallel, and if the Port direction of the selected Equipment is not toward Main Pipe, Automatic Connection is not possible.



AutoCAD
Have wrong connection direction and condition and have '2' equipments not connected automatically. Please check and connect manually.
확인

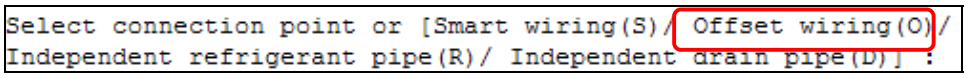
- Smart wiring is possible between already drawn Pipes. (After selecting Main Pipe, select the Pipe to connect, instead of selecting the Equipment.)



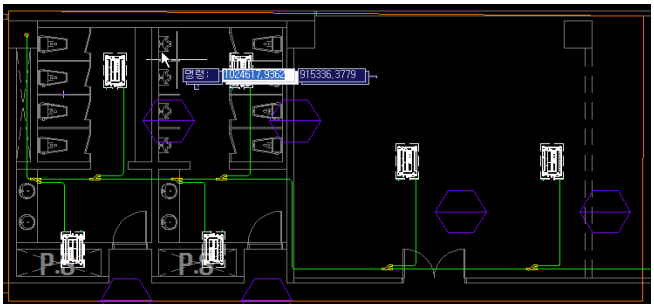
2.2.2 Offset wiring [O]

- Offset wiring is possible connecting automatically drain pipe.

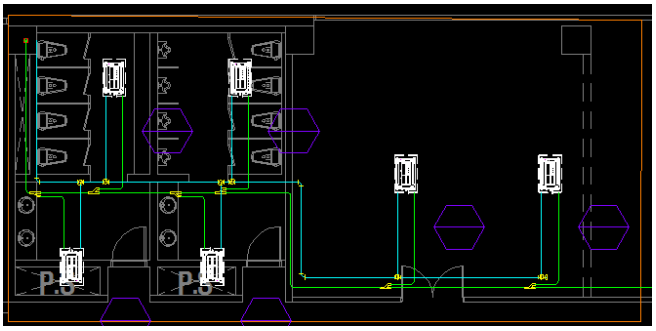
- After executing Menu, input the "O" for Offset wiring in the Command line



- Select already connected Refrigerant Pipe (Main Pipe) and set offset direction



- Drain Pipe is drawn following the lower level structure of the selected Main Pipe, and it is connected to Indoor Unit Drain Pipe Port.



2.2.3 Independent Refrigerant Pipe [R]

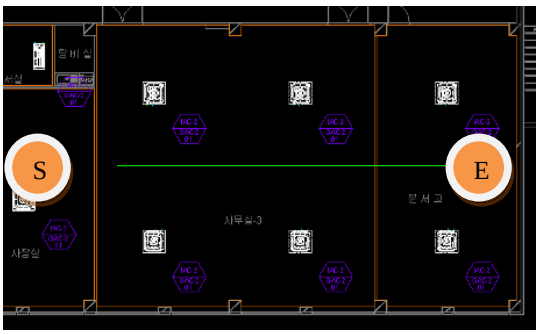
- Independent Refrigerant Pipe is possible without connection to Riser Hole or Port (Refrigerant Pipe).

- After executing Menu, input the "R" for Independent Refrigerant Pipe in the Command line

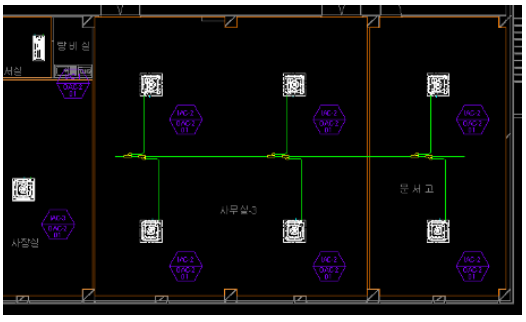
```
Select connection point or [Smart wiring(S)/ Offset wiring(O)/
Independent refrigerant pipe(R)/ Independent drain pipe(D)] :
```

- Position Pipe regardless of the Ports of Riser Hole and Equipment.

Caution! The direction of the Pipe is decided by the first selected point.



- And then, Independent Refrigerant Pipe is possible to automatic Connection using Smart Piping to Indoor Units



2.2.4 Independent Drain Pipe [D]

- Independent Drain Pipe is possible without connection to Riser Hole or Port. (Drain Pipe)

- After executing Menu, input the "R" for Independent Refrigerant Pipe in the Command line

```
Select connection point or [Smart wiring(S)/ Offset wiring(O)/
Independent refrigerant pipe(R)/ Independent drain pipe(D)] :
```

- Pipe may be positioned regardless of the Ports of Riser Hole and Equipment.

Caution! The direction of the Pipe is decided by the first selected point.

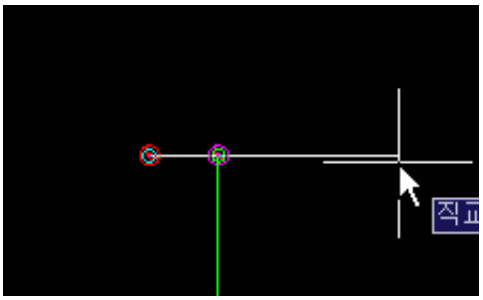
Equipment and Pipe Index

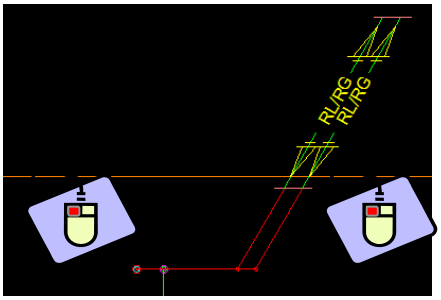
Create Notes for equipment and pipe material.

1. Select Equipment and Pipe Index Menu ( ).

2. Select pipe or riser hole to create notes.

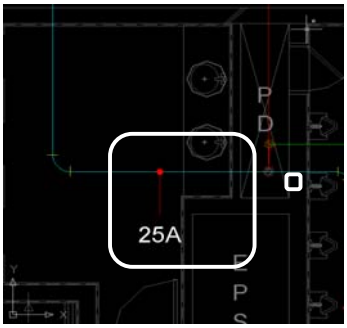
2.1 Select riser hole to position notes, and designate the path. (The same method is applied to control riser hole notes)





2.2 Select pipe to position notes.

- Select pipe to input notes, and designate the position.



Property Information

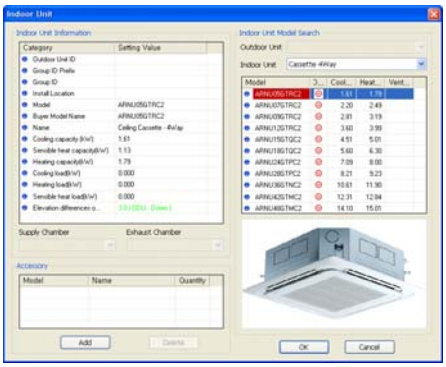
It shows the Property Values of Equipment and Riser Hole.

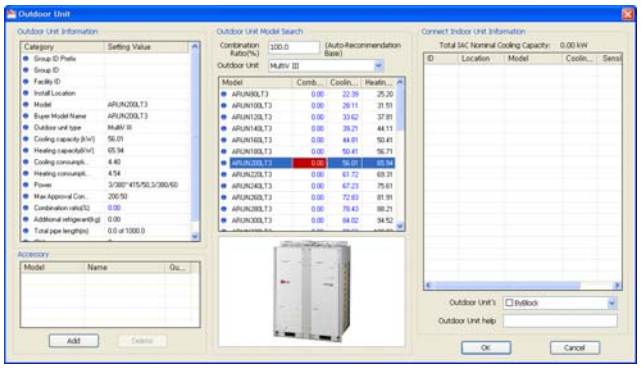
1. Select Property Information Menu ( ).

2. Select the object to see the Property Information in the drawing.

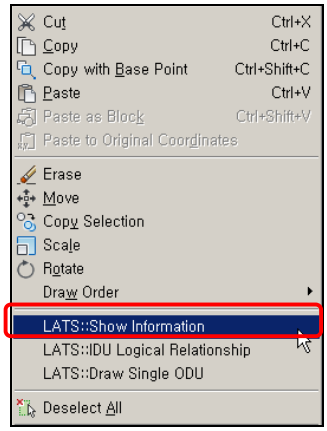
2.1 When Indoor Unit/Outdoor Unit is selected, it shows its property.

2.2 The properties of the selected equipment or Equipment Model can change.



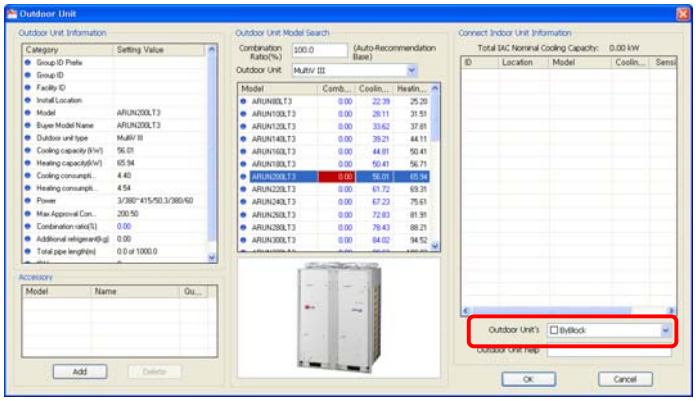


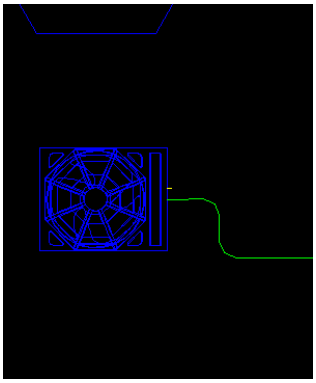
- After selecting the equipment, the same function is supported in LATS Property Information in Pop-up Menu.



2.2.1 Group Color Change (When Outdoor Unit property is changed, the property of the connected Indoor Unit is changed)

(The Color Information of the Equipments connected to Outdoor Unit is changed at once.)



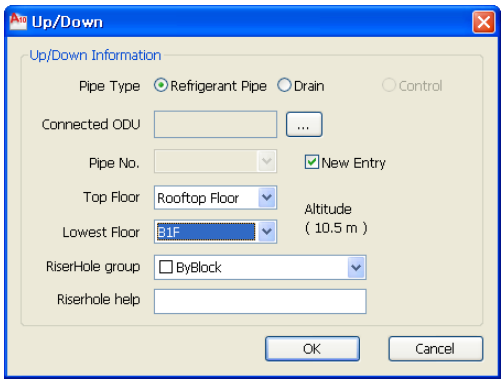


2.2.2 The model of the selected equipment may be changed.

2.2.3 Up/Down Riser Hole Information can be viewed or changed.

- After executing menu, Up/Down Riser Hole

- The property information (Classification/Floor Information/Color) can change.

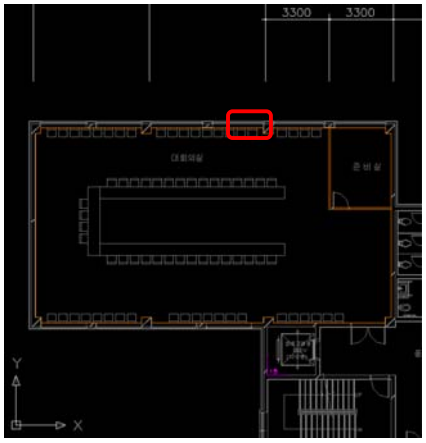


Auto-arrange Indoor Unit

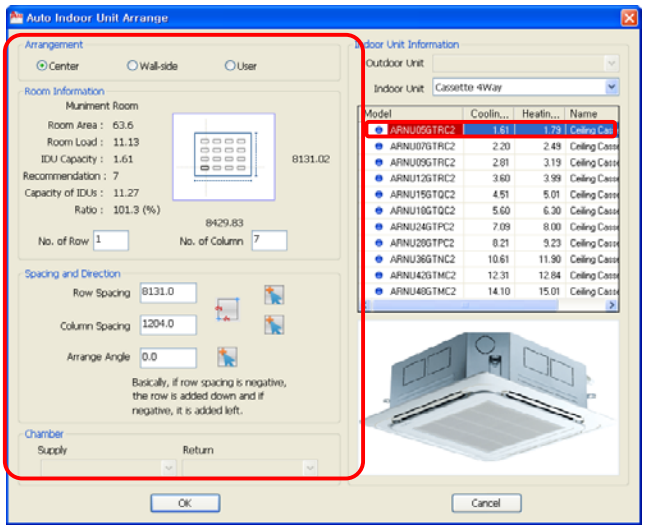
Based on the selected Room and Indoor Unit, Indoor Unit is automatically positioned. (Exists only in Indoor Unit tab of Symbol Pane)

1. Select Auto-arrange Indoor Unit Menu ( ).

2. Select the Room Area Boundary Line to position.

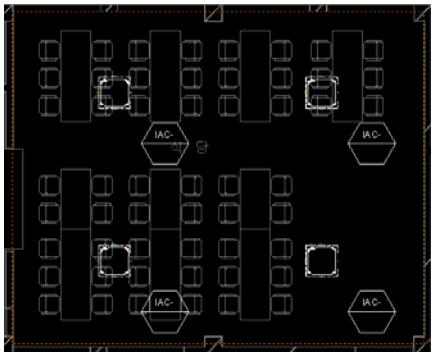


3. When the Indoor Unit to apply is selected, the recommended number of units is provided with the consideration of Room area and load.

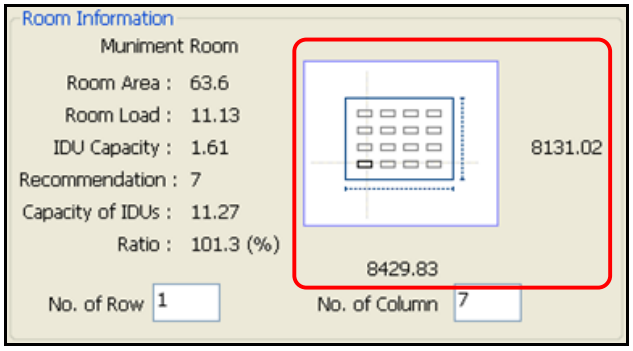


3.1 Arrangement

3.1.1 Center: It positions the selected equipments based on the center of the corresponding “Room”.



3.1.2 Wall-side: It positions based on the walls in 4 directions, and it sets the location of the wall to position and the number (row, column).



3.1.3 User: It positions based on the location designated by the user.

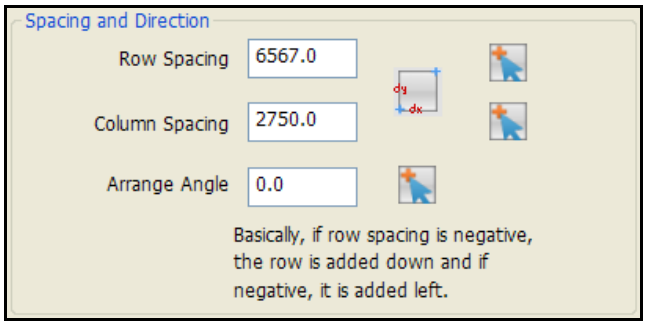
3.2 Room Information

- The Room Area/Room Load of the selected Room Area is displayed, and the recommended number for the Indoor Unit capacity is displayed.

- Input the number of equipments to be positioned through the input of “No. of Row” and “No. of Column”.

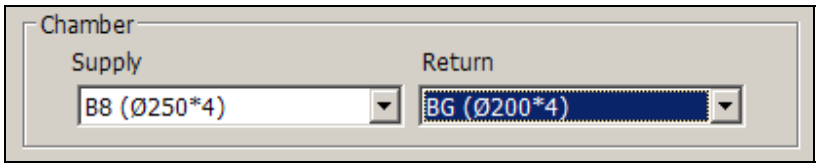
3.3 Spacing and Direction

- Designate the gap between the equipments and the angle.

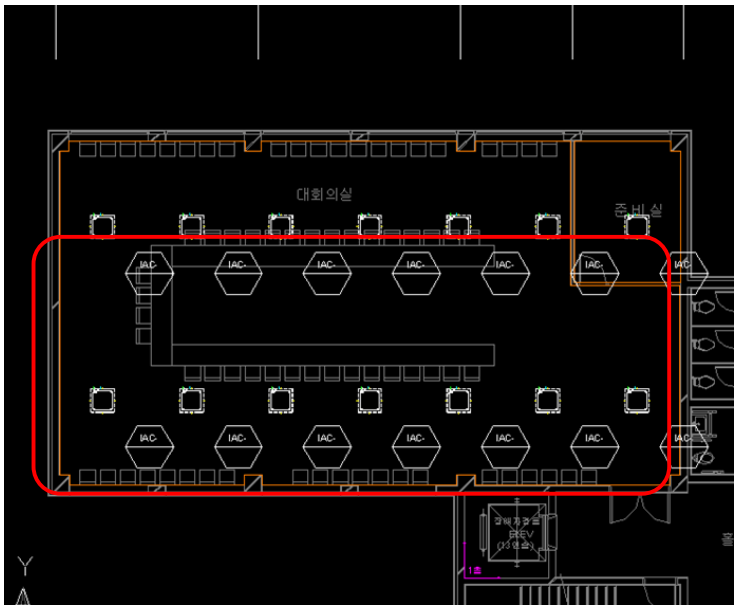

Spacing and Direction
Row Spacing 6567.0
Column Spacing 2750.0
Arrange Angle 0.0
Basically, if row spacing is negative, the row is added down and if negative, it is added left.

3.4 Chamber

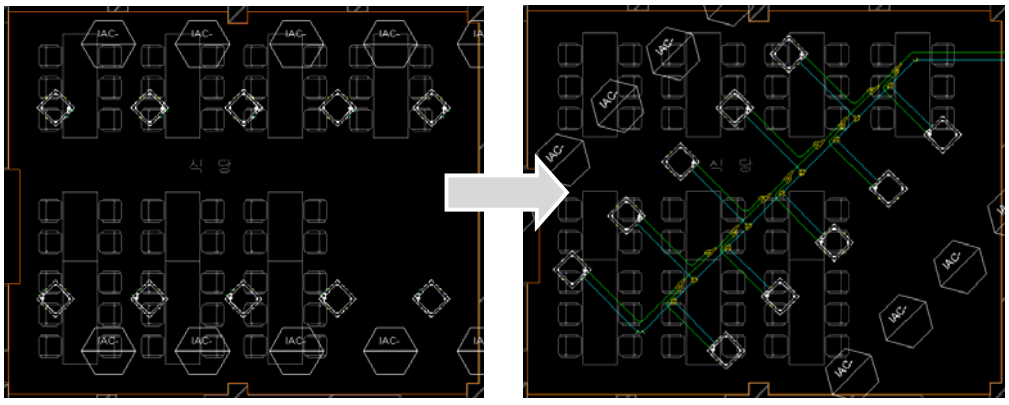
- It is activated when ceiling concealed duct type (high static pressure) Indoor Unit is selected, and it designates the air Supply/Return chamber pipe diameter.



4. It is automatically positioned in the corresponding Room in the drawing according to the set conditions.



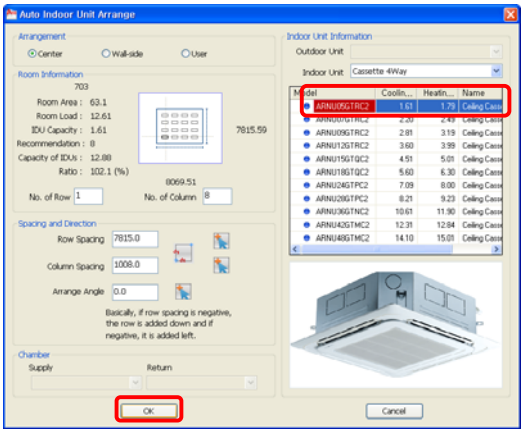
- When UCS is changed, automatic positioning according to the changed angle is possible.

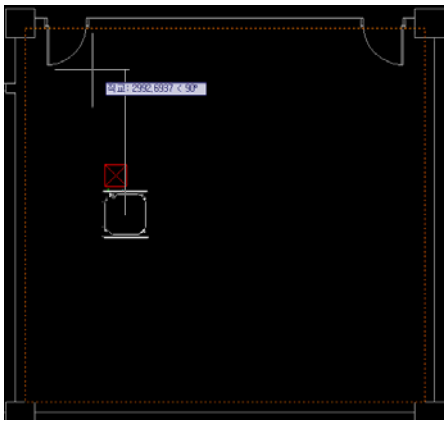


Result of the existing automatic positioning Result of the changed automatic positioning

4.1 Multi V Indoor

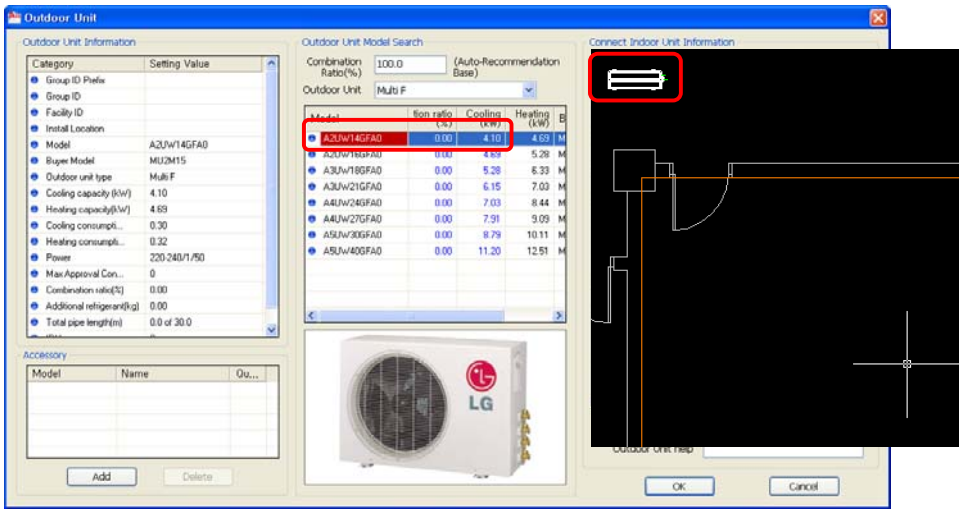
- Select Indoor Unit.



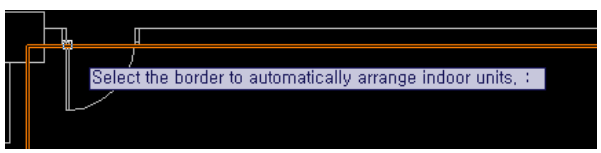


4.2 Multi Indoor & Single A Indoor

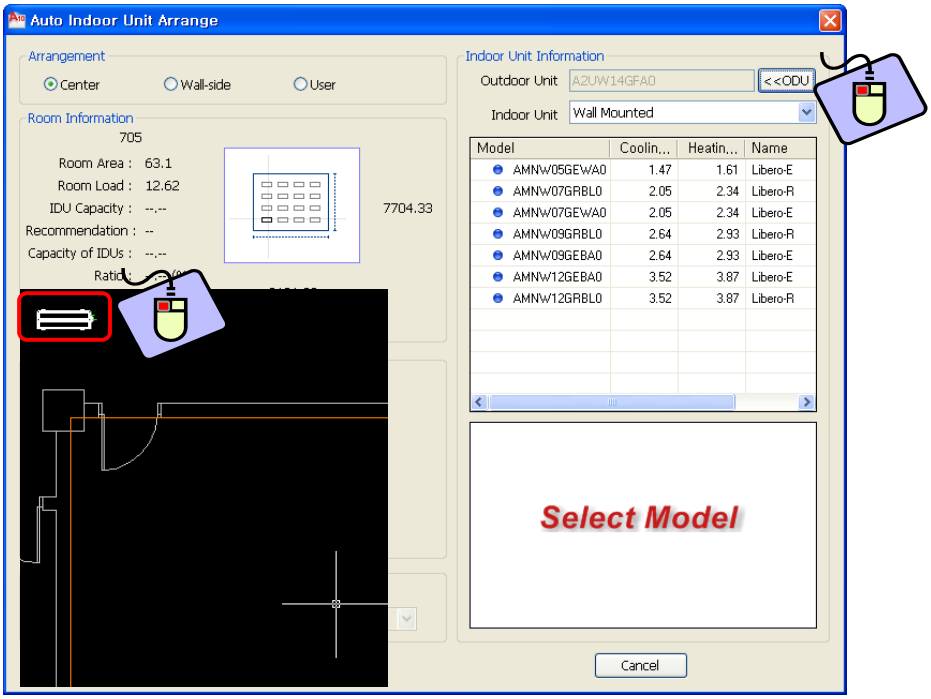
- Insert the ODU Unit before using Auto-arrange Indoor Unit function.



- Use Auto-arrange Indoor Unit function.



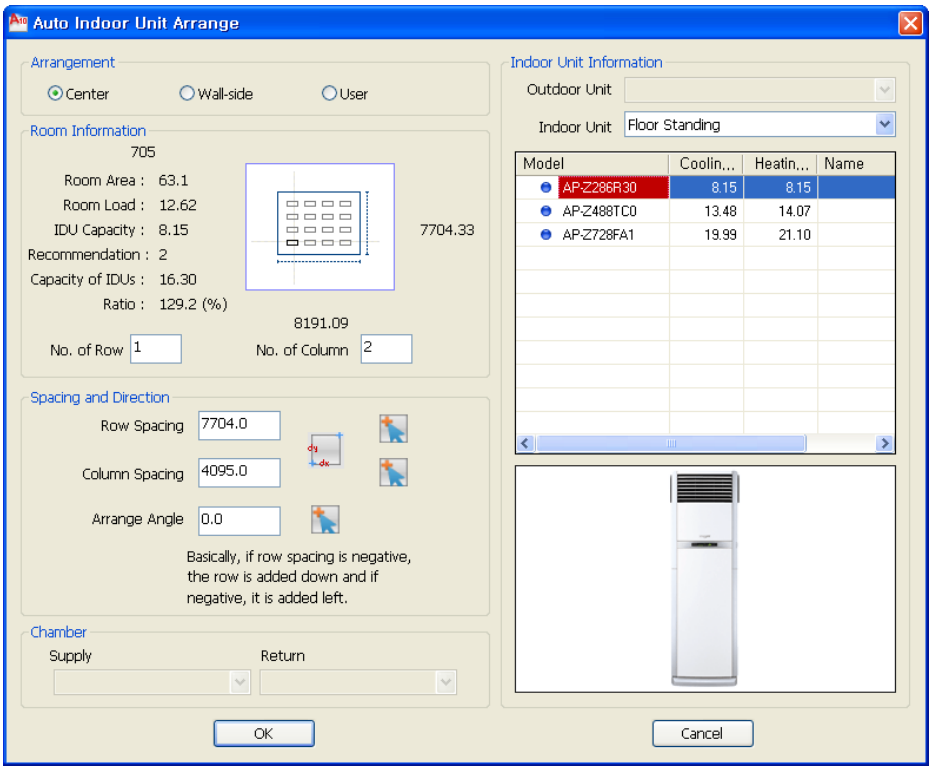
- Select ODU in Indoor Information, Click the ODU unit in drawing.



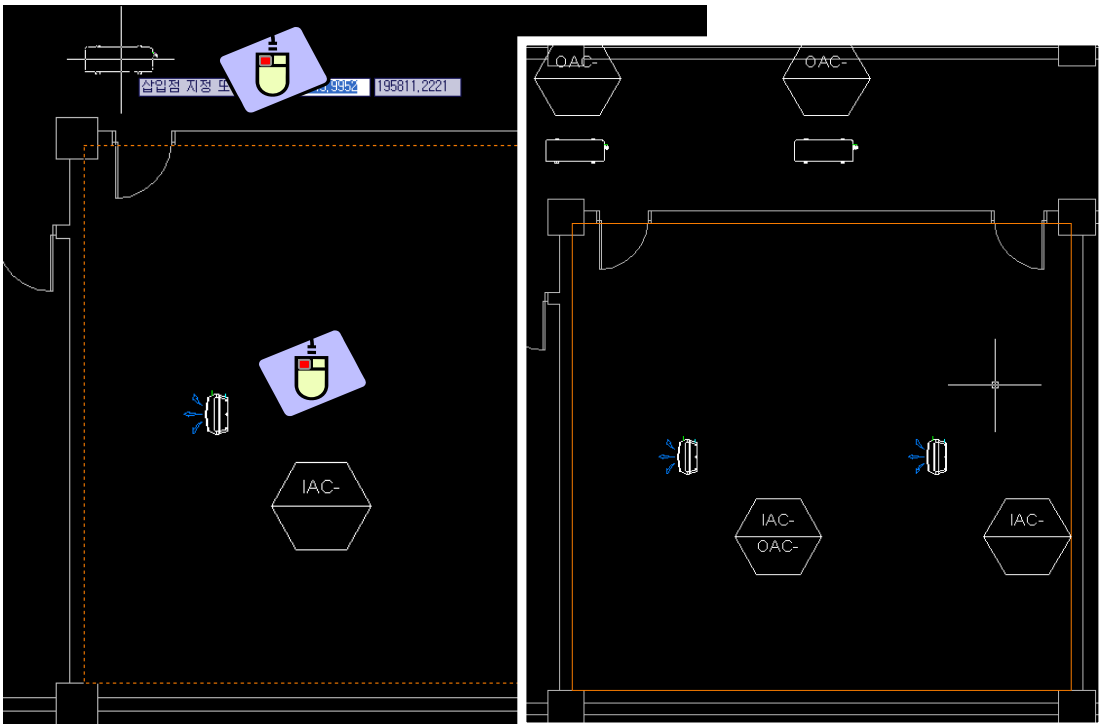
- Select Indoor Unit.

4.3 Single Indoor

- Select Indoor Unit.



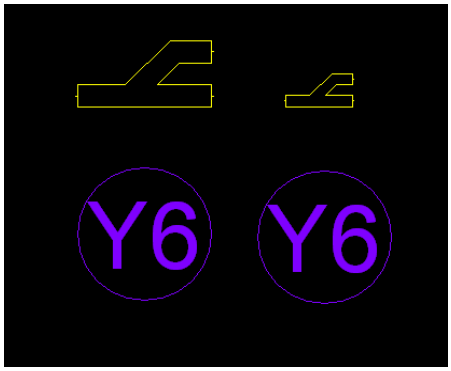
- input the IDU, and then input the ODU in the drawing.



Material Scale (in Material Index)

Material scale can be adjusted for the Material Index tab. (It exists only in Material Index tab of Symbol Pane)

1. After setting the Material scale, select and position the desired Pipe.



Control Wiring

1. Select Control Wiring Menu ( ). (Exists only in Control Solution tab of Symbol Pane)

2. Manual Connection

2.1 Select the Control Port of the Equipment to connect, and connect without selecting Option.

2.2 The types of the communication lines are decided by the types of the connected equipments.

- Indoor Unit (or ventilation)-Remote Controller: Remote Controller Communication Line

- Indoor Unit (or ventilation)-Indoor Unit (or ventilation), Indoor Unit-Outdoor Unit (or Riser Hole): Outdoor Unit Communication Line

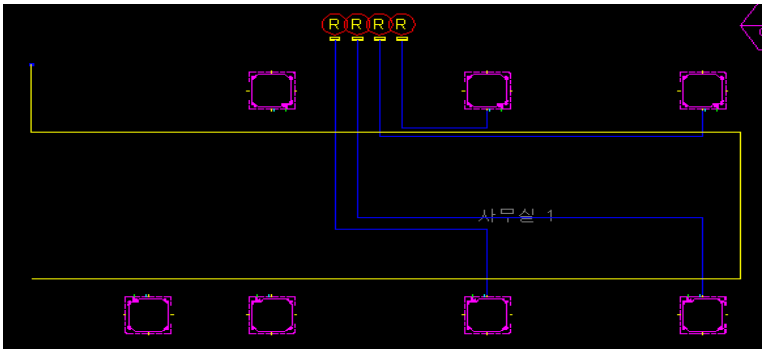
- Controller-Outdoor Unit (or Riser Hole), Controller-Indoor Unit (or ventilation): Central Control Communication Line

3. Select Control Wiring Option

```
Select cable connection point OR [Smart(S)/ Chainn(C)/ Remocon
Offset(O)] :
```

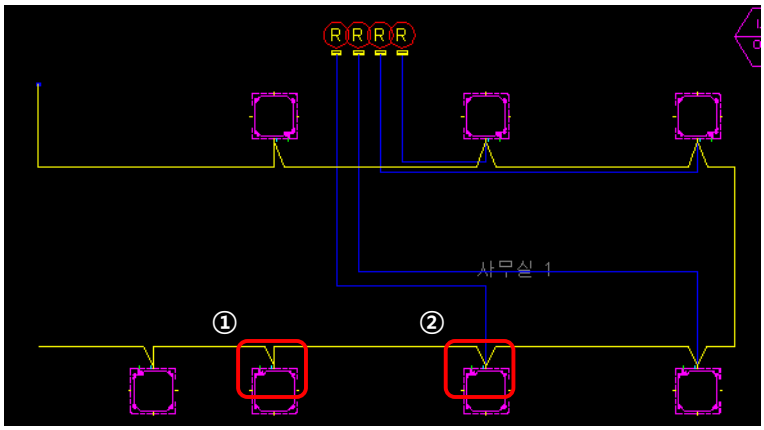
3.1 Smart (S): The same can be applied to the connection between Controllers.

3.1.1 Select Riser Hole or Indoor Unit Port to draw Central Control Line.



3.1.2 Select Smart (S) in Control Wiring Option of Command line.

3.1.3 Select Main Control Line, and select Indoor Units to connect to.



3.1.4 Based on Central Control Line, Indoor/Outdoor Unit Communication Lines are automatically connected.

Caution! If Communication Line is connected to the Control Port of Indoor Unit (or ventilation), the remaining 3 Ports cannot be used.

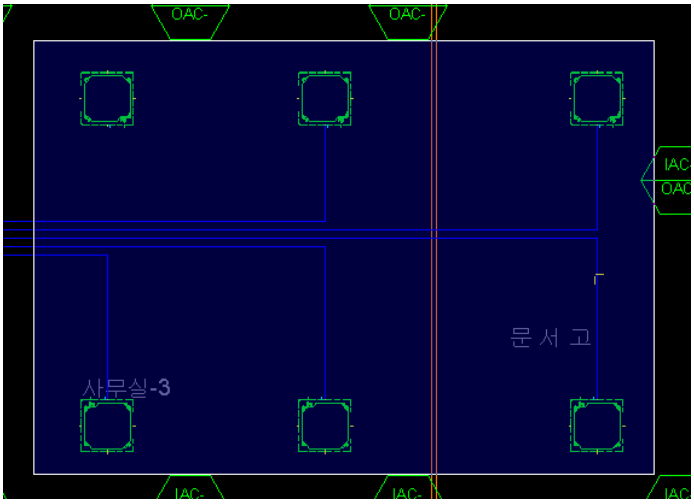
Caution! While Indoor Unit is not connected to Remote Controller Communication Line or Central Control Communication Line, if Indoor/Outdoor Unit Communication Line is connected, the Communication Line connection angle is not the same(①), but when it is connected after other Communication Line is connected, the connection angle is displayed to be the same. (②) It is recommended to connect Remote Controller Communication Line first and then connect Indoor/Outdoor Unit Communication Lines.

3.2 Chain (C): The same may be applied to the connection between Controllers.

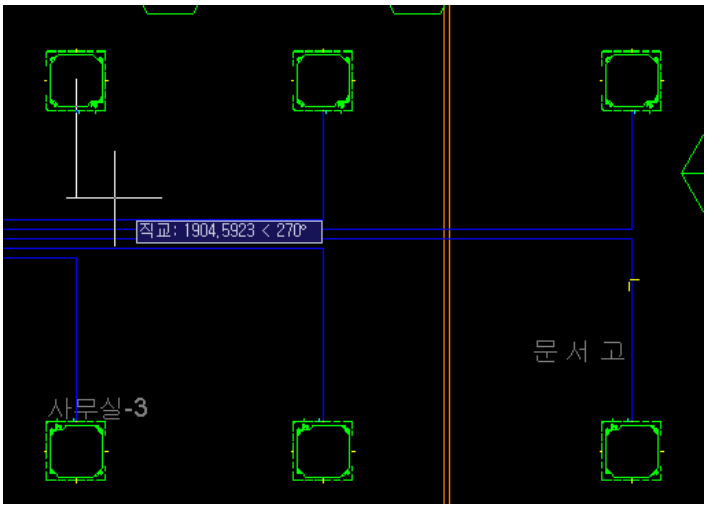
3.2.1 Select Chain (C) in Control Wiring Option of Command line.

3.2.2. Select the Equipments to connect.

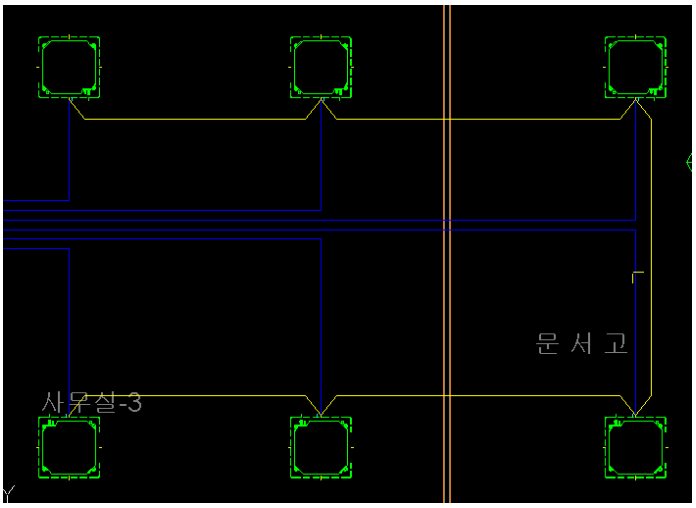
- The Cabling direction is set by the order of selecting the equipments.



3.2.3 Designate the Wiring direction.

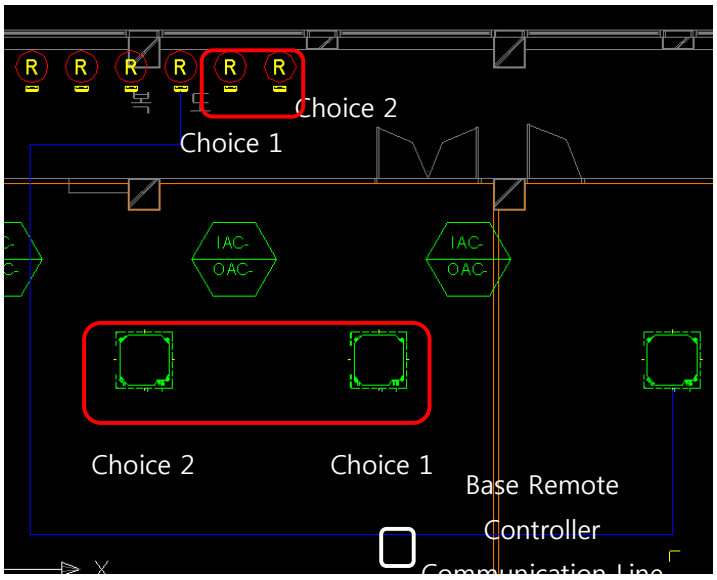


3.2.4 Based on the selected equipments, Indoor/Outdoor Unit Communication Line is automatically connected.



3.3 Remocon Offset (O)

3.3.1 Manually connect the base Remote Controller Communication Line to Indoor Unit (or ventilation) and Remote Controller.



3.3.2 Select Remocon Offset (O) in Control Wiring Option of Command line.

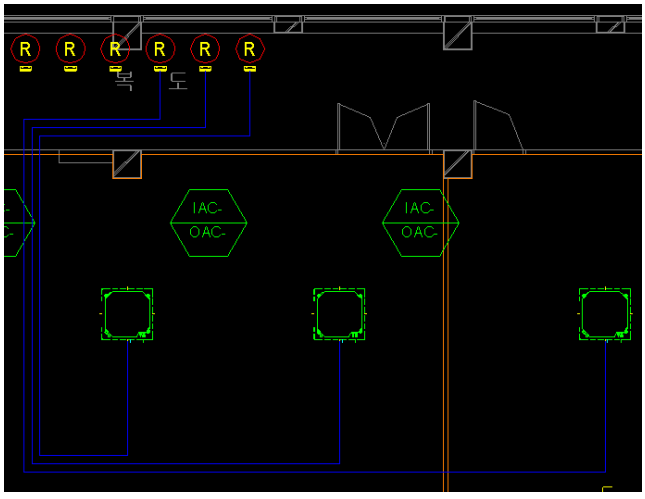
3.3.3 Select the Cable to refer to. (Base Remote Controller Communication Line)

3.3.4 Select Indoor Units to connect, sequentially.

3.3.5 Select Remote Controllers to connect, sequentially.

3.3.6 Remote Controller Communication Line is automatically connected between the selected Indoor Unit and the Remote Controller

- Remote Controller and Indoor Unit (or ventilation) are connected according to the order of selection.

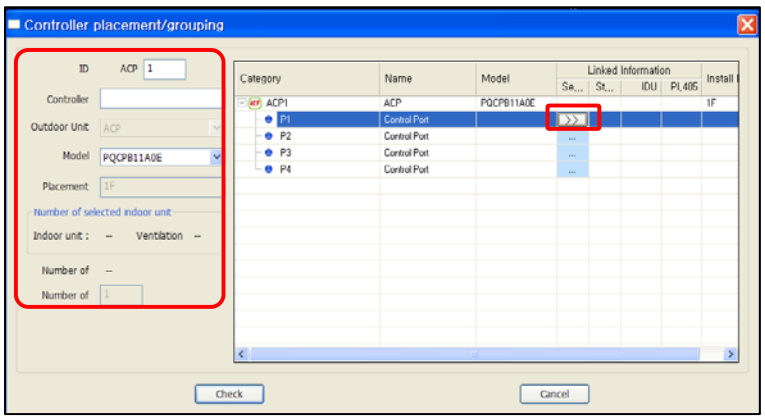


Control Logic Configuration (Control Check)

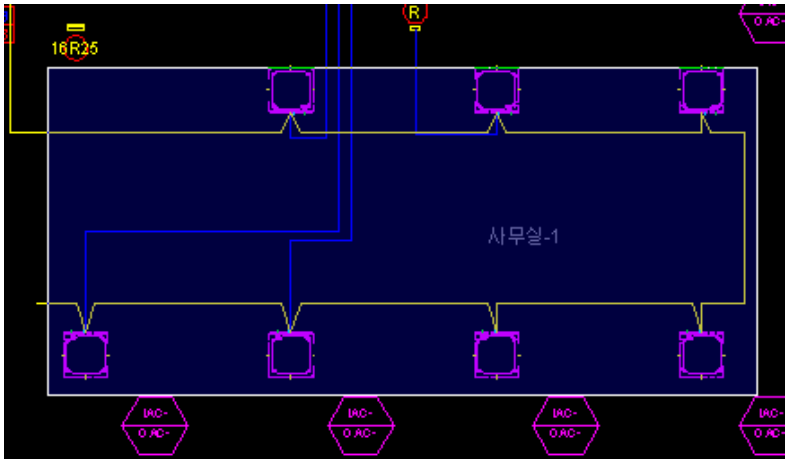
After selecting Menu, select the equipment to connect the Control. (Exists only in Control Solution tab of Symbol Pane)

1. Select Control Logic Configuration Menu ( ).

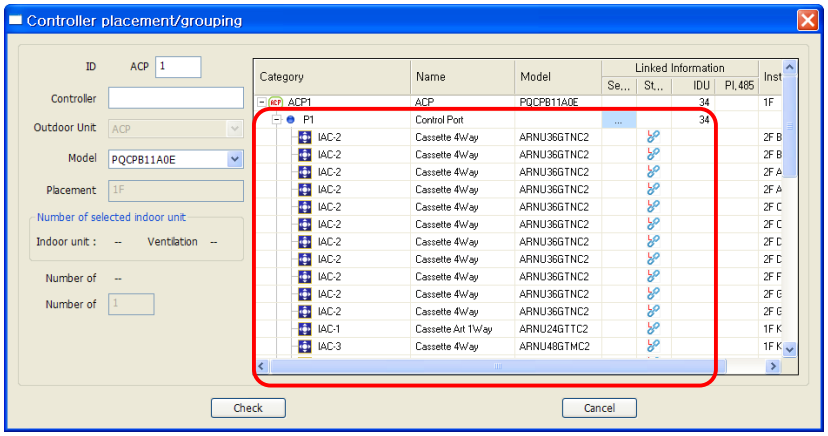
2. Select Controller already positioned and set Control name and Model name.



3. Select the Indoor Unit to connect in the drawing.



4. Logically connected state is displayed.



- When an Indoor Unit logically connected to another Controller is selected, a message for new logic composition is displayed.

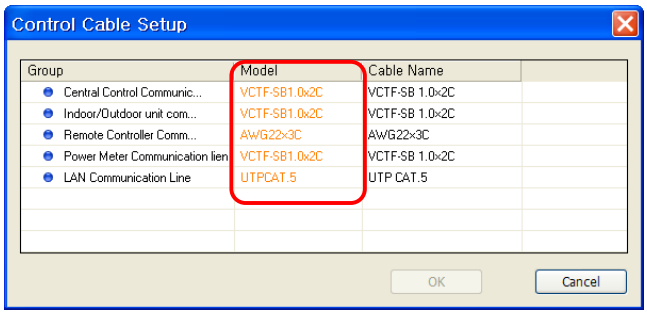
- The composition of Indoor/Outdoor Unit Communication Line and Central Control Communication Line connected to Controller-Outdoor Unit-Indoor Unit is changed to physical connection icon.

Control Cable Model Setting

It sets the model for each control cable. (Exists only in Control Solution tab of Symbol Pane)

1. Select control cable model setting Menu ( ).

2. Set the model to be applied to each communication line type.

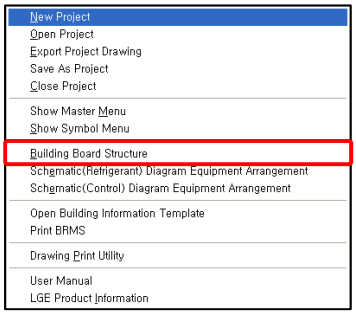


System Diagram Drawing

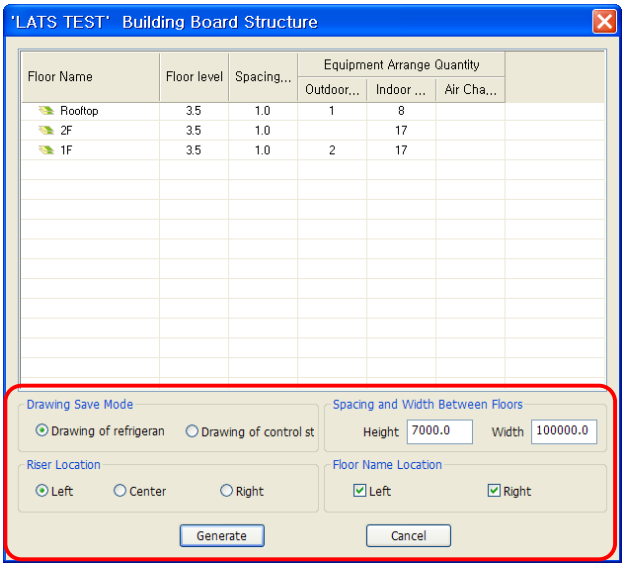
Building Board Structure

Before inserting the system diagram, first insert the layer structure of the entire building.

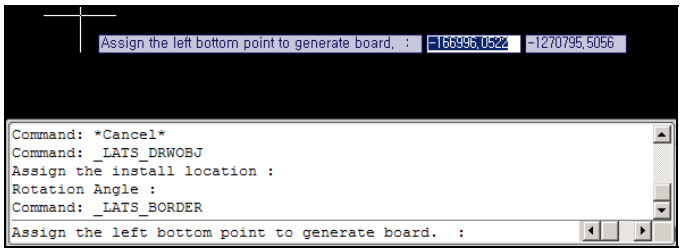
1. Select "LATSCAD → Building Board Structure" in Pull Down Menu.



2. Select or input Drawing Save Mode / Riser Location / Spacing and Width between Floors / Floor Name Location.



3. Select the selection of left bottom point to generate board.

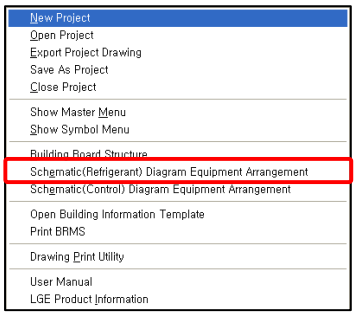


4. Building Board to draw System Diagram is created as follows.

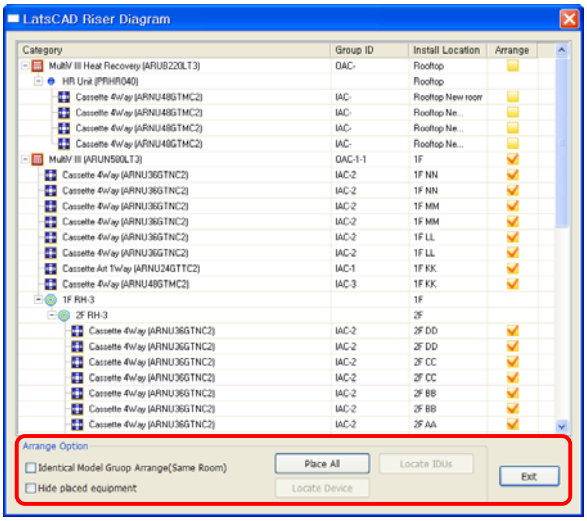
Schematic (Refrigerant) Diagram Equipment Arrangement

1. Select "LATSCAD → Schematic(Refrigerant) Diagram Equipment Arrangement" in Pull Down Menu.

- When composing the Building Board, System Diagram Type shall be selected as Refrigerant Structure Diagram.



2. Proceed in the order of Outdoor Unit Positioning → Indoor Unit Positioning.



3. Select Arrange Option.

3.1 Identical Model Group Arrange (Same Room)

- When "Identical Model Group Arrange (Same Room)" is selected in Arrange Option, Indoor Unit Notes and Positioned Rooms are displayed as a group.

3.2 Hide Placed equipment

- Hide Equipments of placing in Building Board to Riser Diagram. When all Equipments positioned in Building Board, not exist equipment in Riser Diagram.

3.3 Place All

- select "Place All" → All Equipments of Riser Diagram are positioned in Building Board.

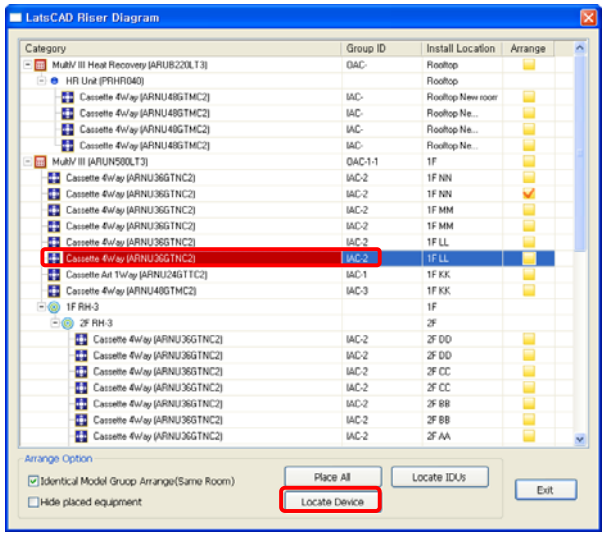
3.4 Locate IDUs

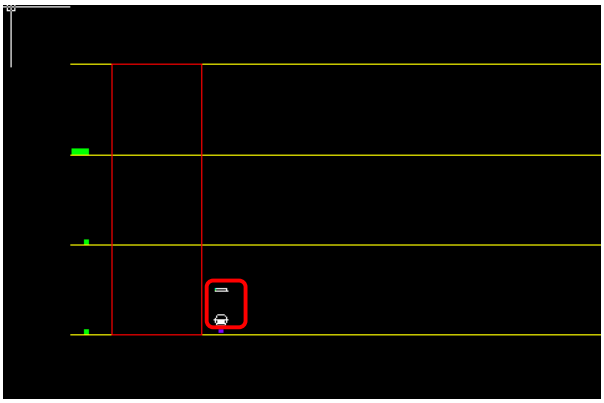
- After selecting Outdoor Unit or Riser in Riser Diagram, select "Locate IDUs" → Indoor Units are positioned in Building Board.

(Indoor Units connected to the selected Outdoor Unit are automatically positioned.)

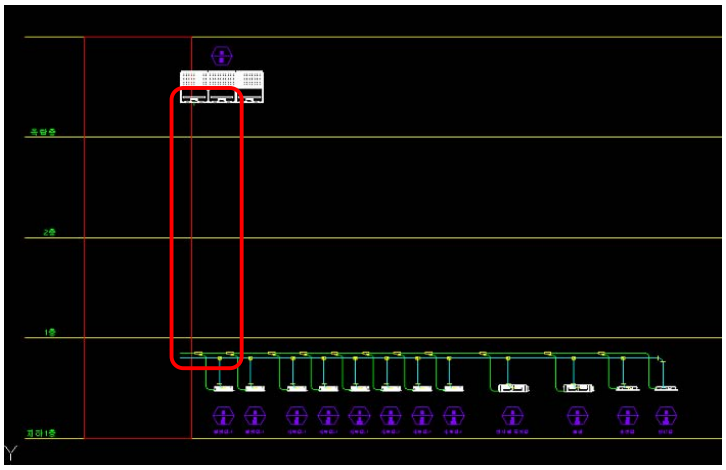
3.5 Locate Device

- After selecting Outdoor Unit or Indoor Unit in Riser Diagram, select “Locate Device” → The selected equipments are positioned in Building Board.





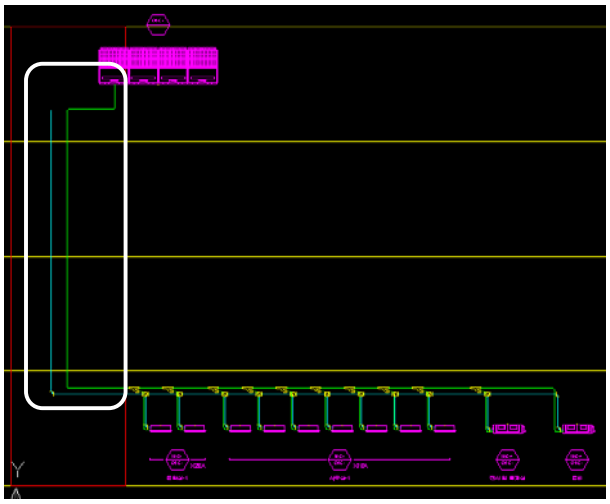
4. The connection between Outdoor Unit-Indoor Unit is manually connected through Piping Equipment.



4.1 Execute Piping Equipment Menu in Symbol Pane.

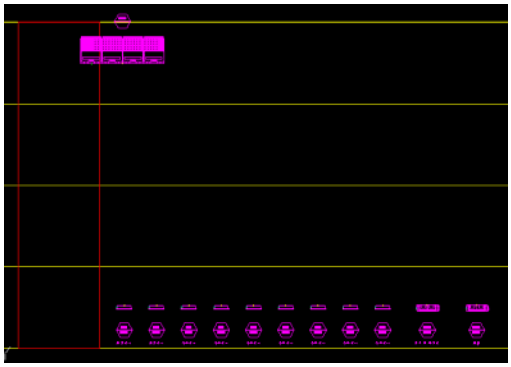
4.1.1 Connect Refrigerant Pipe and Drain Pipe (during manual positioning)

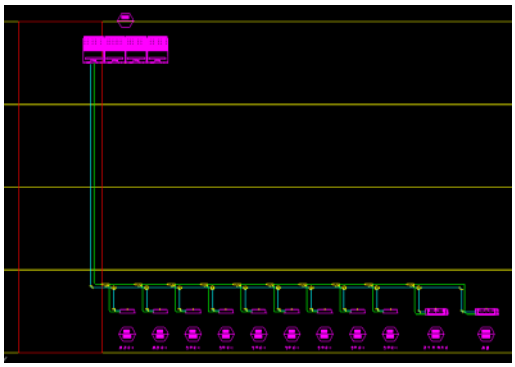
- Connect with Outdoor Unit by selecting Piping Equipment Menu. (It performs the piping only to Outdoor Unit.)



4.1.2 Refrigerant Pipe and Drain Pipe connection (during automatic positioning)

- Connect by selecting Smart Wiring and Offset Wiring.

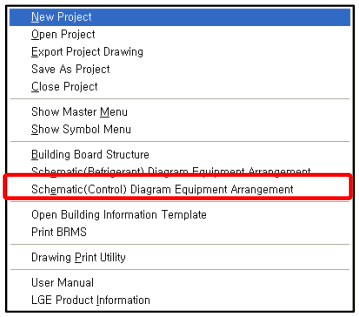




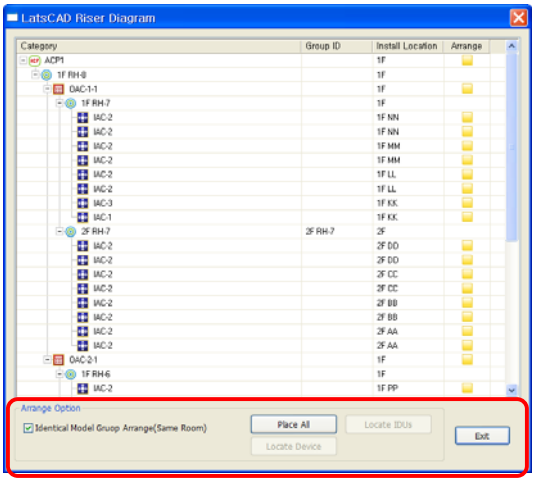
Schematic (Control) Diagram Equipment Arrangement

1. Select "LATSCAD → Schematic (Control) Diagram Equipment Arrangement" in Pull Down Menu.

- When Building Board Structure, System Diagram type shall be selected as Control Structure Diagram.

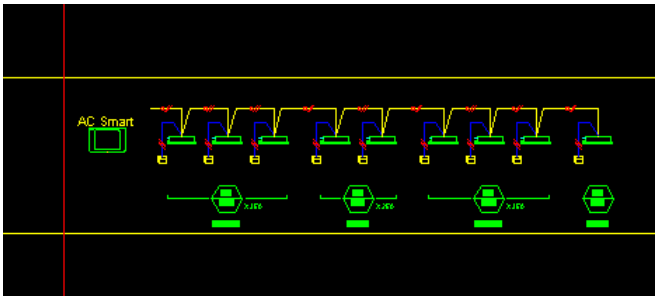


2. Select Arrange Option. (Identical Model Group Arrange(Same Room))



2.2.1 Identical Model Group Arrange (Same Room)

- When "Identical Model Group Arrange (Same Room)" is selected in Arrange Option, Indoor Unit Notes and Positioned Rooms are displayed as a group.



2.2.2 Place All

- select "Place All" → All Equipments of Riser Diagram are positioned in Building Board.

2.2.3 Locate IDUs

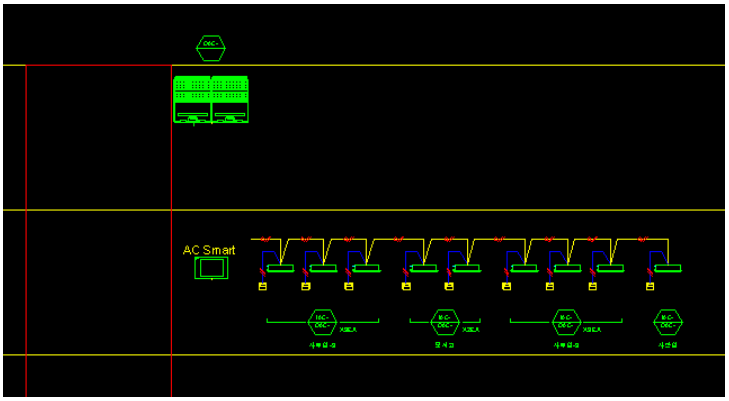
- After selecting Outdoor Unit or Riser in Riser Diagram, select "Locate IDUs" → equipments of Indoor Units are positioned in Building Board.

(Indoor Units connected to the selected Outdoor Unit are automatically positioned.)

2.2.4 Locate Device

- After selecting Outdoor Unit or Indoor Unit in Riser Diagram, select "Locate Device" → The selected equipments are positioned in Building Board.

2.3 Select Control Wiring Menu of Control Solution Tab to connect Indoor/Outdoor Unit Communication Lines and Central Control Communication Line.



System Validation Check

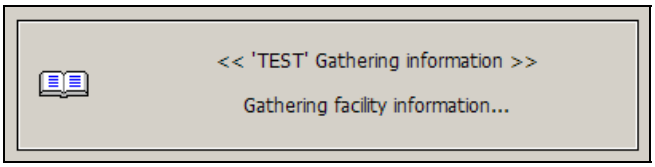
Perform the inspection for pipe diameter, branching pipes, and system efficacy, and show the result.

Drawing Refresh

It shows the initialization of the drawing information and the currently composed Outdoor Unit, Indoor Unit connecting structure.

Perform refresh for the equipment connection information.

If check Drawing Refresh, reflect information of drawing (Auto CAD) in the LATS CAD.

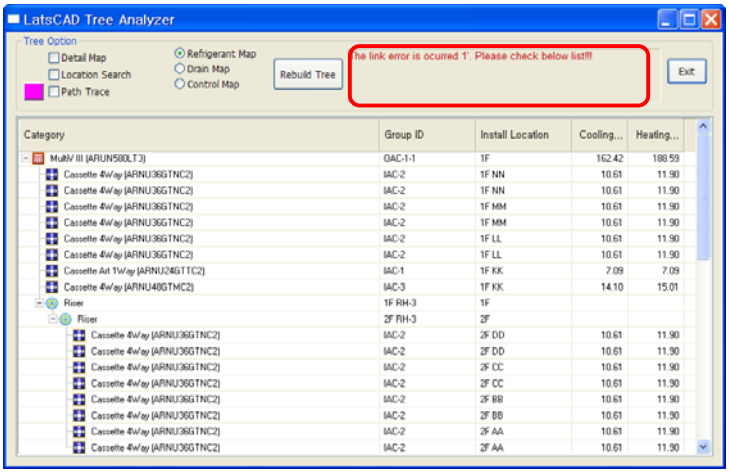


Caution! When use function of Auto CAD like Undo, Delete, Copy..., must check Drawing Refresh.

Checking Connect Condition (Drawing Check)

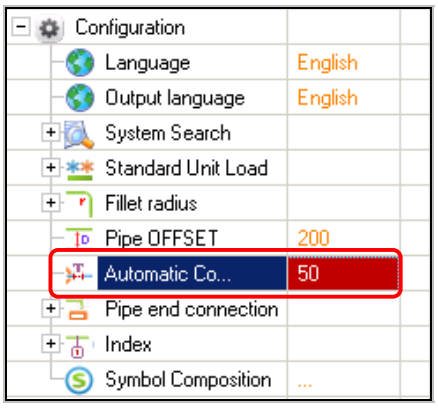
It initializes the drawing information and shows the outdoor unit and indoor unit connection structure currently composed.

Verify the structure diagram of each of refrigerant/drain/control line, and check the error in the connection composition.

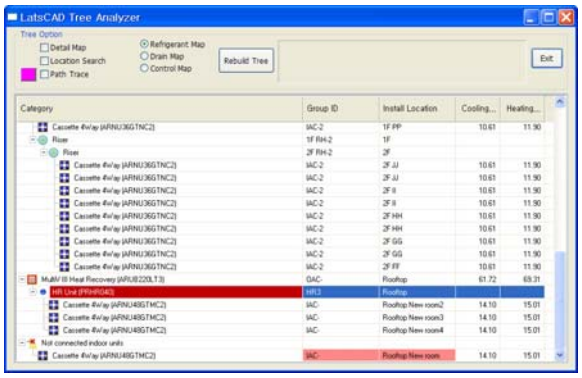


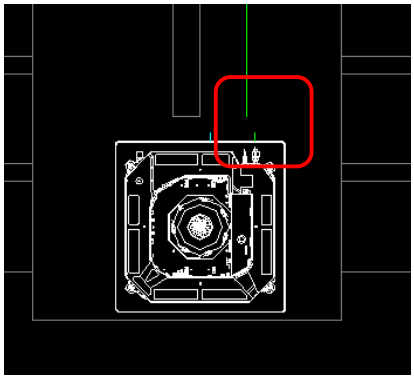
1. Drawing Information Initialization

Initialize the ports of the positioned equipments and perform automatic connection of the equipments that are not connected. (Automatic Link Connection)

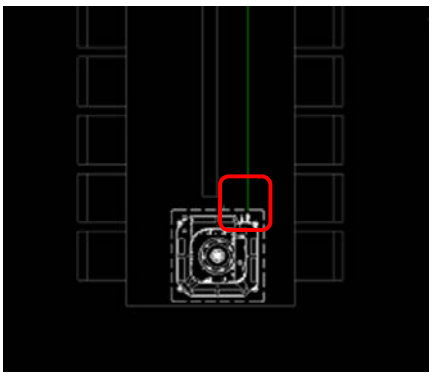


1.1 When there is a port not connected within Automatic Connection Tolerance of Configuration, it is automatically connected.





1.2 Verify Automatic Connection Tolerance, and execute Checking connect Condition → Port is automatically connected

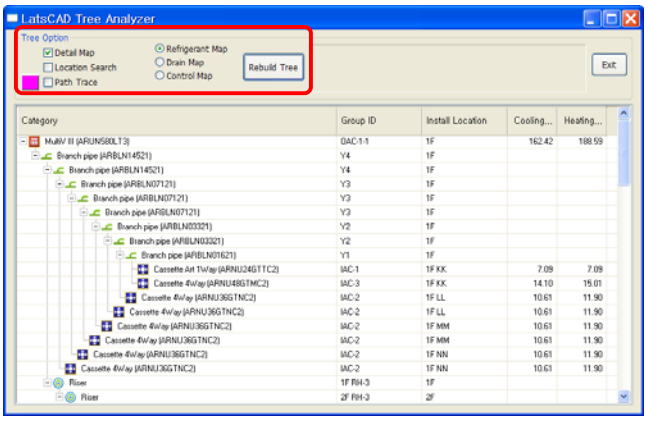


2. Detail Map

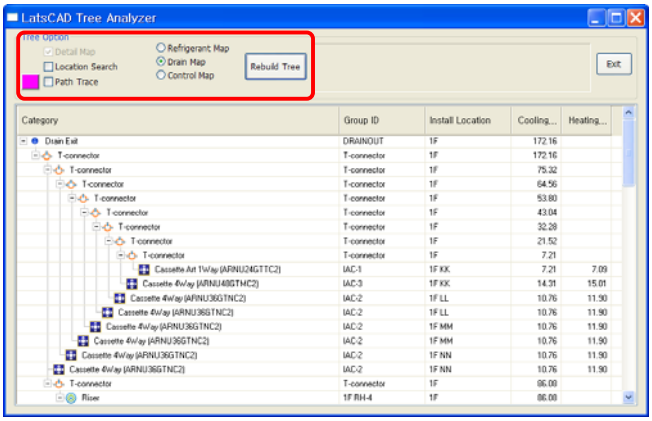
- Select Detail Map in Tree Option, and click Rebuild Tree.

- It is displayed as Detail Map including branching pipes.

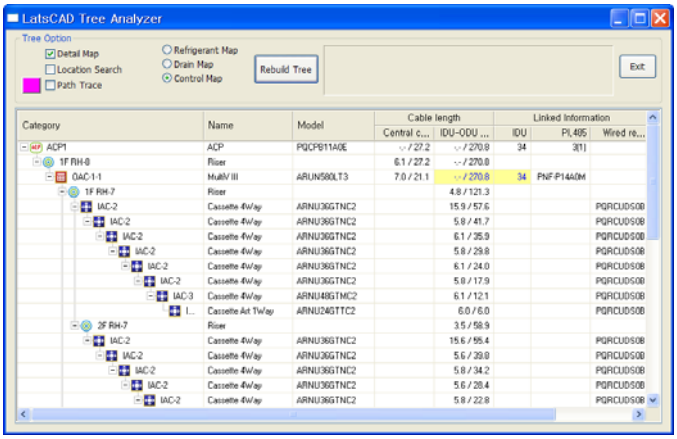
2.1 Refrigerant Map



2.2 Drain Map

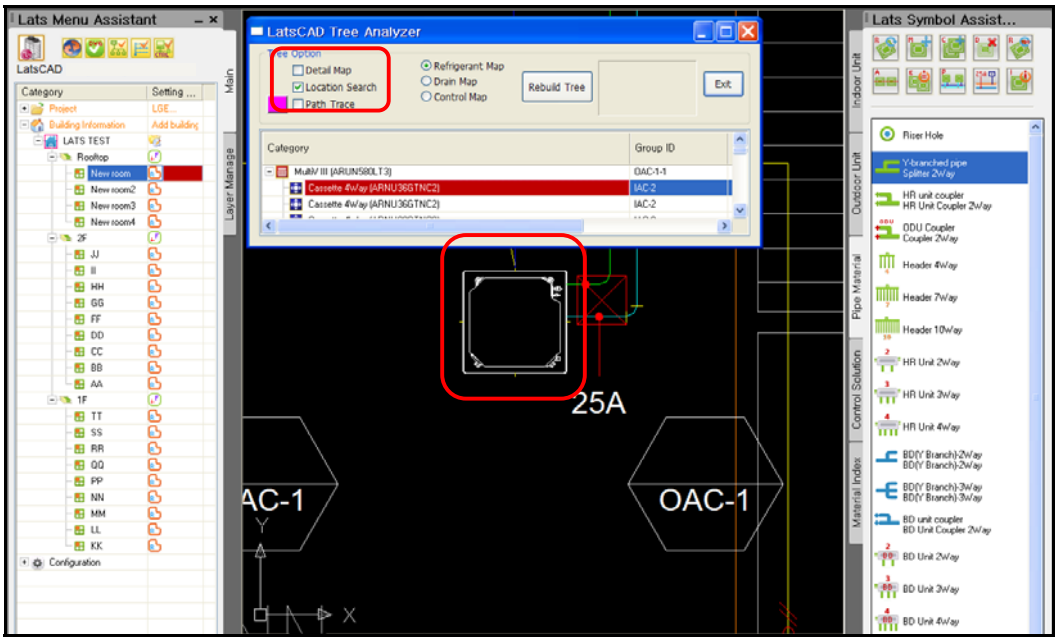


2.3 Control Map



3. Location Search

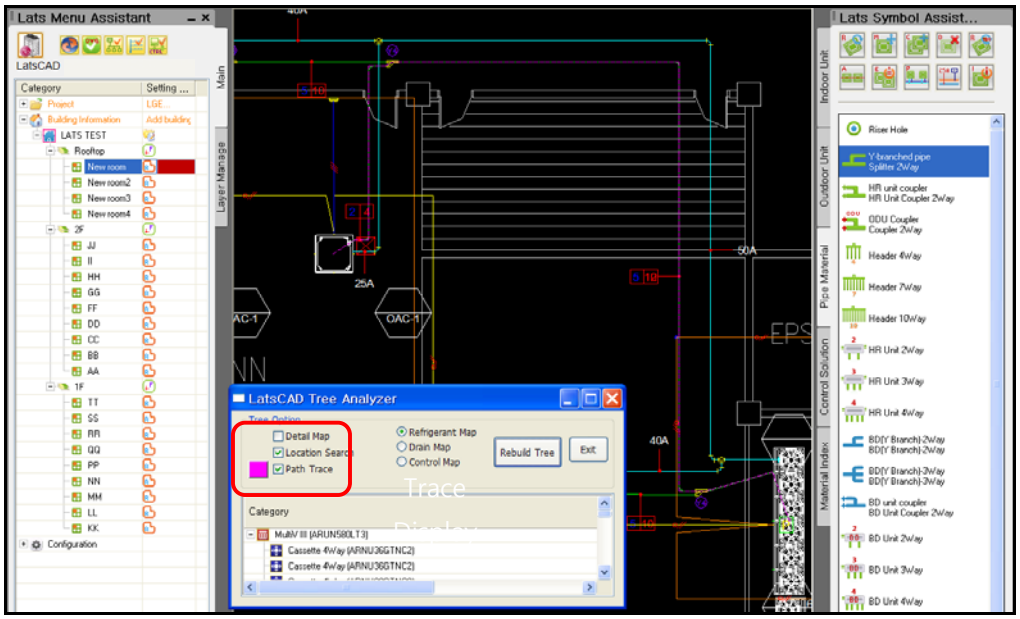
- Move the screen in the drawing to the selected equipment.



4. Path Trace

- Select Trace in Tree Option, and select the indoor unit to verify.

- The Outdoor Unit Trace of the selected indoor unit is displayed.

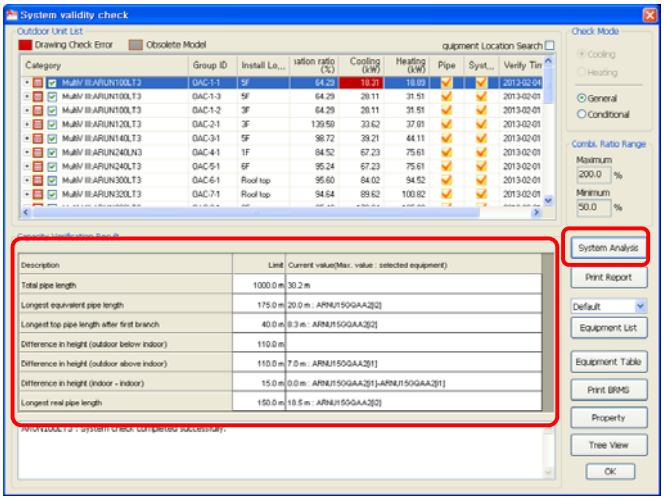


- The equipment connection information is displayed along the pipes, and the connection between riser hole and riser hole is displayed as a straight line.

Checking Refrigerant Pipe Validation (System Check)

1. System Analysis (Perform checking refrigerant pipe validation and verification after connection is completed, and created the result value in the drawing)

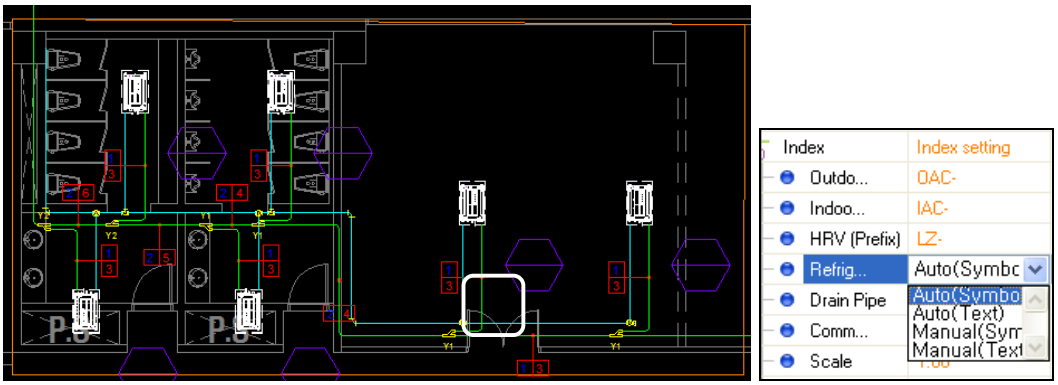
1.1 Select outdoor unit to verify and select system analysis.



1.2 Show the system check result values in Capacity Verification Result.

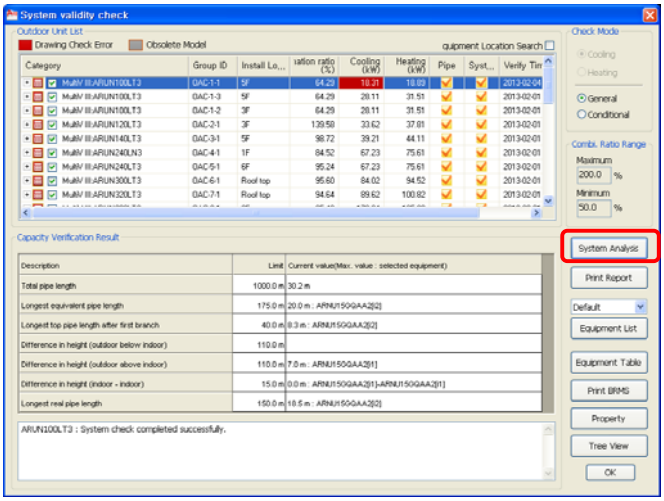
1.3 The pipe diameter and branching pipe symbol are inserted automatically in the drawing.

(When Index of Configuration is selected as Manual, it is not displayed. It is input by the user through Equipment and Pipe Index of Symbol Pane)



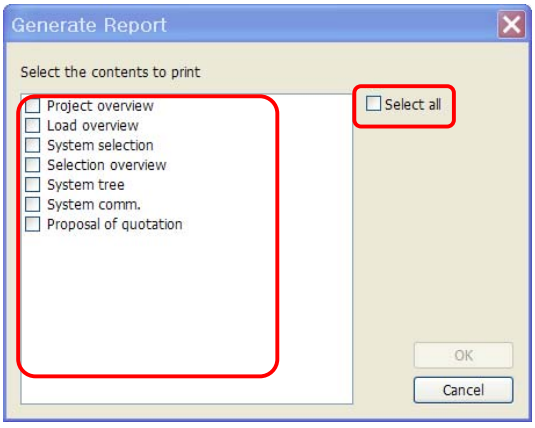
2. Print Report

2.1 It outputs the designed drawing information in a report format.



2.2 Select the contents to print.

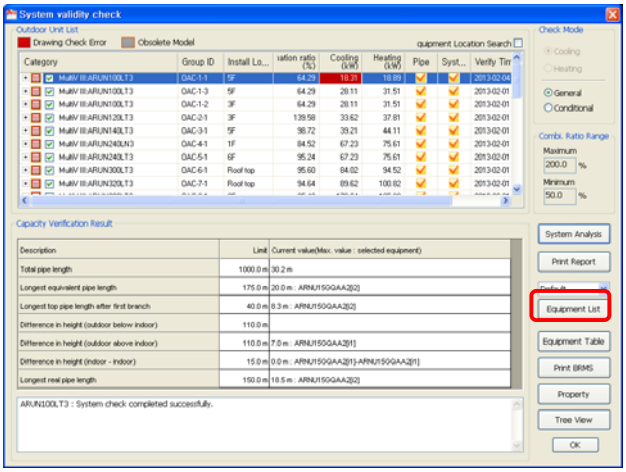
- Select the contents to print through checking each option or “Select all”.



2.3 The report is print in Excel File format.

3. Equipment List

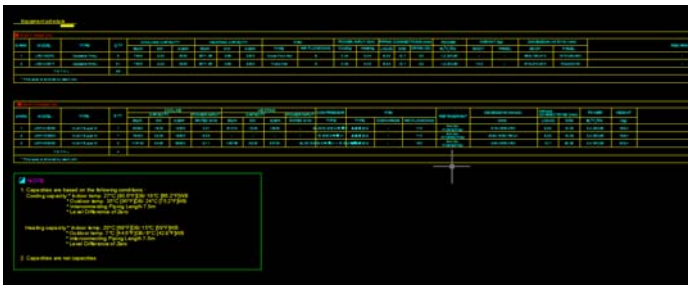
Equipment and pipe information applied to the drawing are output in Table form.



3.1 Assign the reference point to enter Equipments list in the drawing.

```
Assign the reference point to enter equipment list :
```

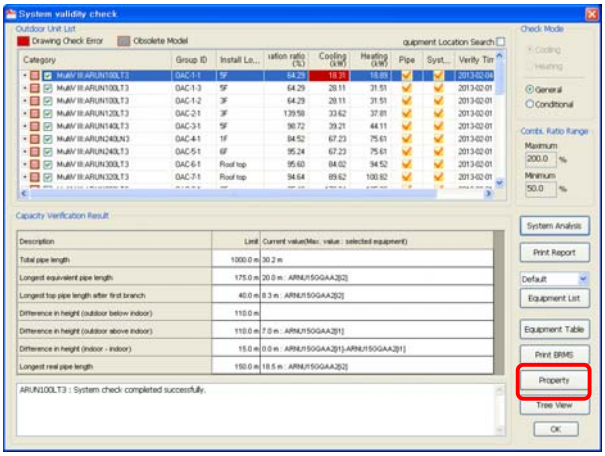
3.2 Equipment List is inserted in the drawing.



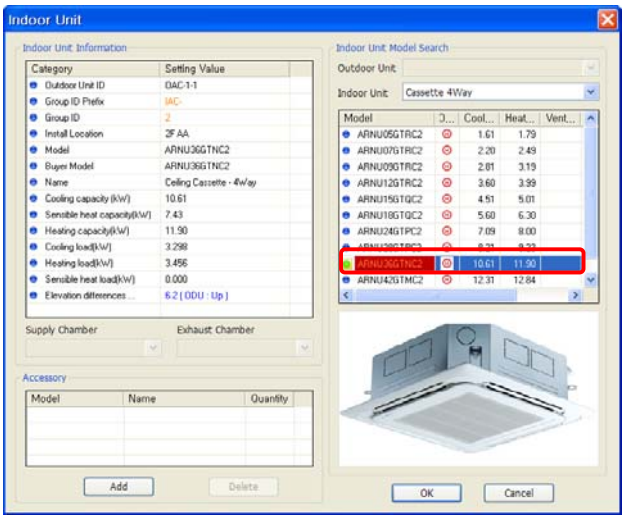
4. Property

Property function can Verify and change indoor unit / outdoor unit model.

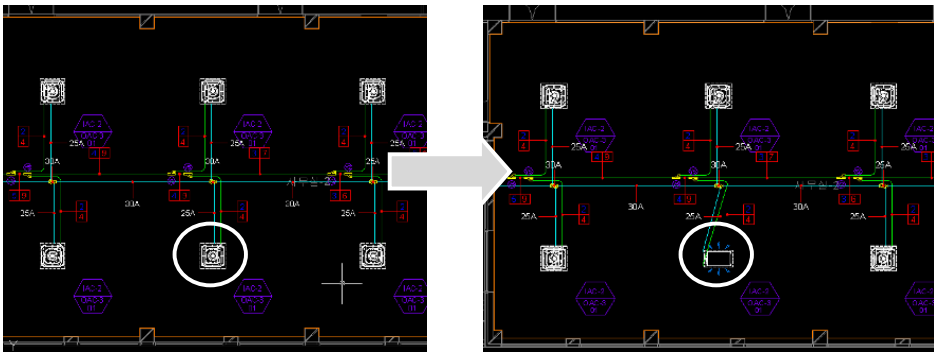
4.1 Select the indoor unit or outdoor unit to verify or change, and select property.



4.2 Verify the property of the selected model, and select the desired model if change is necessary.

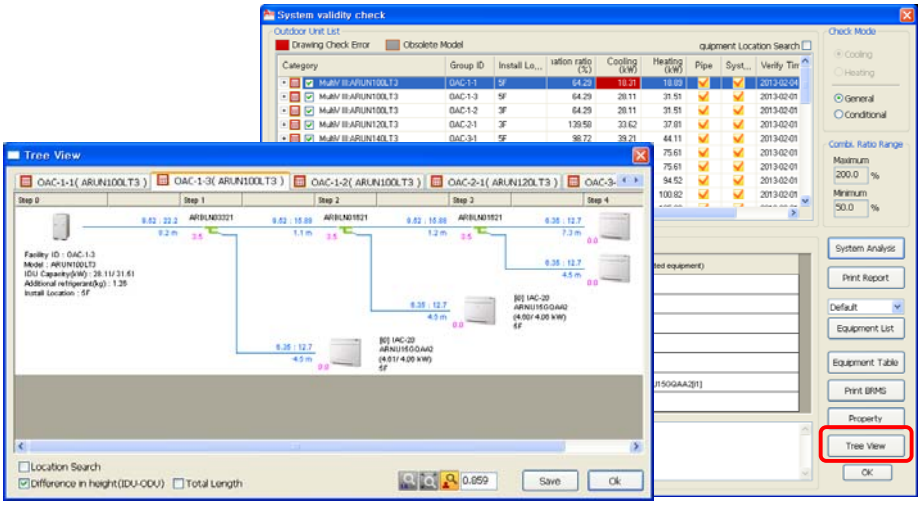


4.3 The corresponding equipment is changed in the drawing.

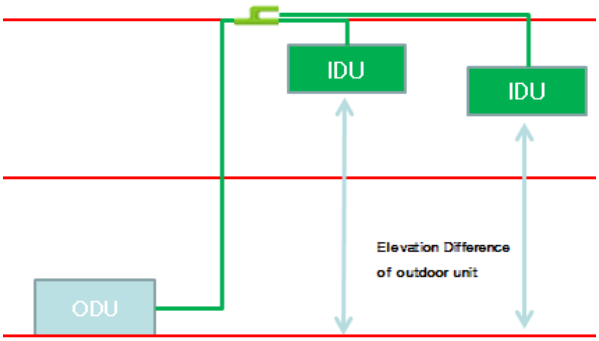


5. Tree View

Tree view can check each system information.



- Difference in height (IDU-ODU):

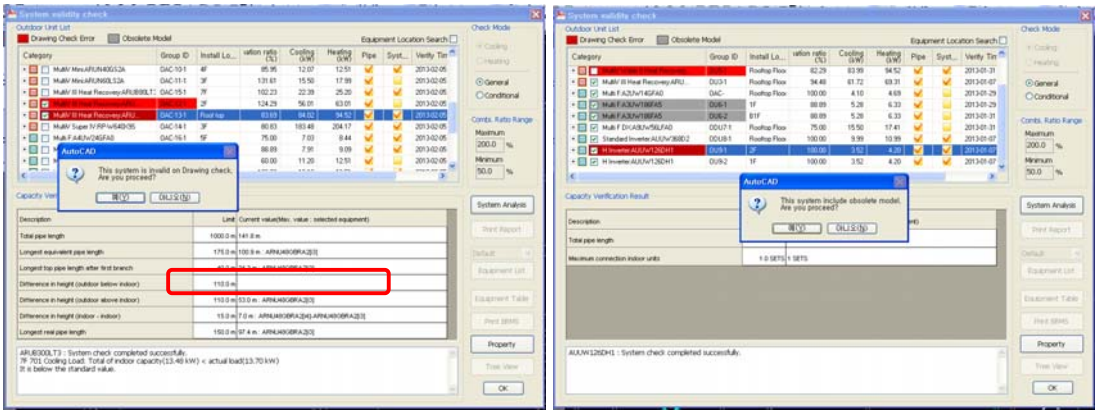


6. Drawing Check Error & Obsolete Model

6.1 Drawing Check Error (Red): System check function will check capacity simulation.

It cannot check drawing mistake. Do it drawing check first if you want to find drawing mistake.

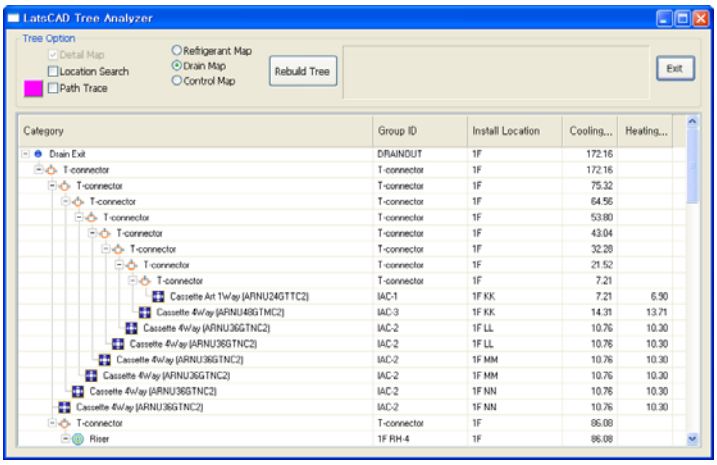
6.2 Obsolete Model (gray): When you open the old project including obsolete model, check the model.



Checking Drain Validation (Drain Check)

1. Check the Drain Pipe connection structure, select the pipe diameter to create the result value in the drawing.

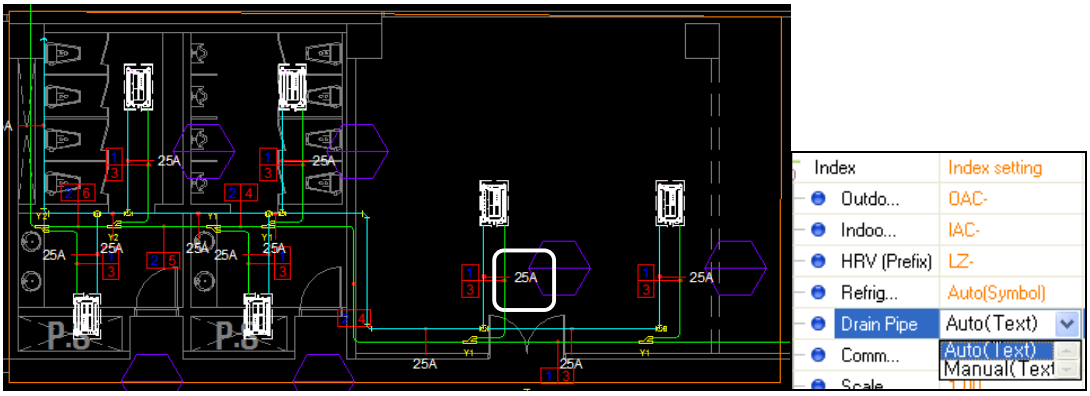
2. It shows the connection structure based on Drain Exit or Discharge Riser Hole.



Caution! 'Drain Exit' or "Drain Riser Hole' Symbol must be connected to the last exit part of the Drain Pipe to create the structure.

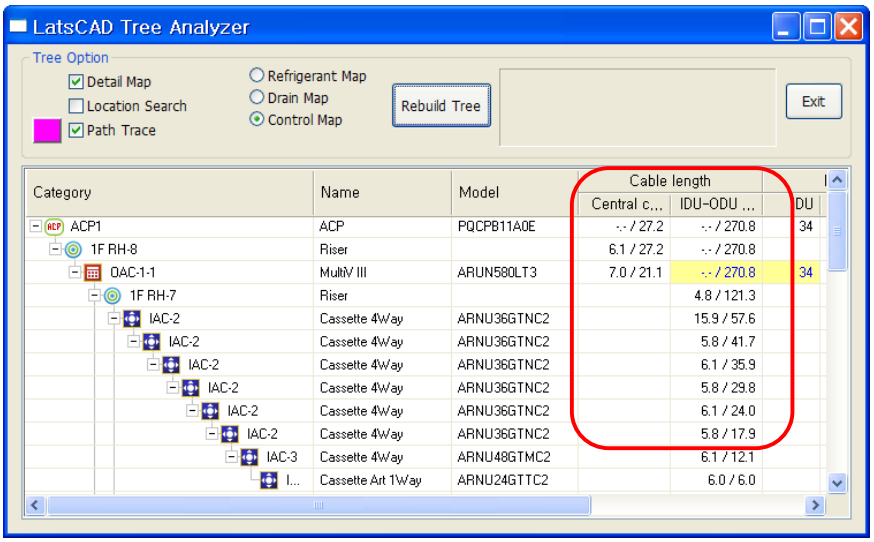
3. Drain Pipe Diameter is automatically created in the drawing.

- When Index of Configuration is selected as Manual, it is not displayed. It is input by the user through Equipment and Pipe Index of Symbol Pane.

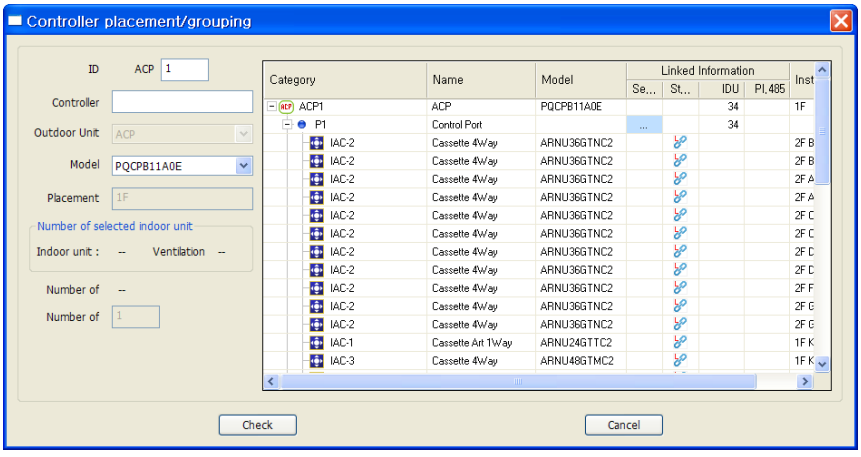


Checking Communication Line Validation (Control Check)

1. Based on the Central Control Line, it verifies the Cable length, the number of Indoor Units connected to Controller, and the number of PI.485 Points.



It displays the physical connection. When checking logical connections, use Control Logic Configuration Menu of Symbol Pane.



Function Description for Each Pane

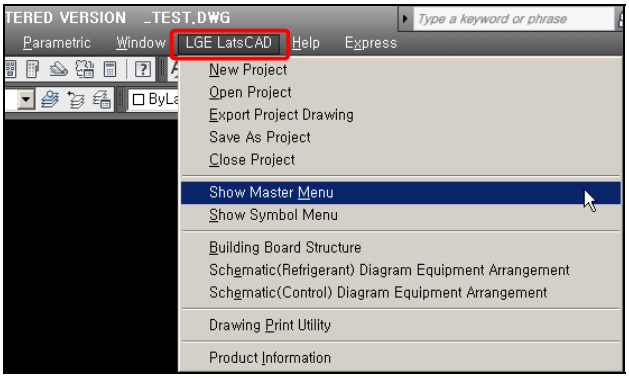
This capture describes which operations are done in the functions in each Pane, and it is the explanation page based on the conditions and the exceptional cases to use the functions.

Master Pane and Symbol Pane

Pane has 2 types as Master Pane at left of window and Symbol Pane at right of window. Master Pane has 2 Tabs of Master Tab and Layer Tab. And Symbol Pane has 5 Tabs of Indoor Unit Tab, Outdoor Unit Tab, Pipe Material Tab, Control Solution Tab, and Material Index Tab.

1. Showing Pane Menu

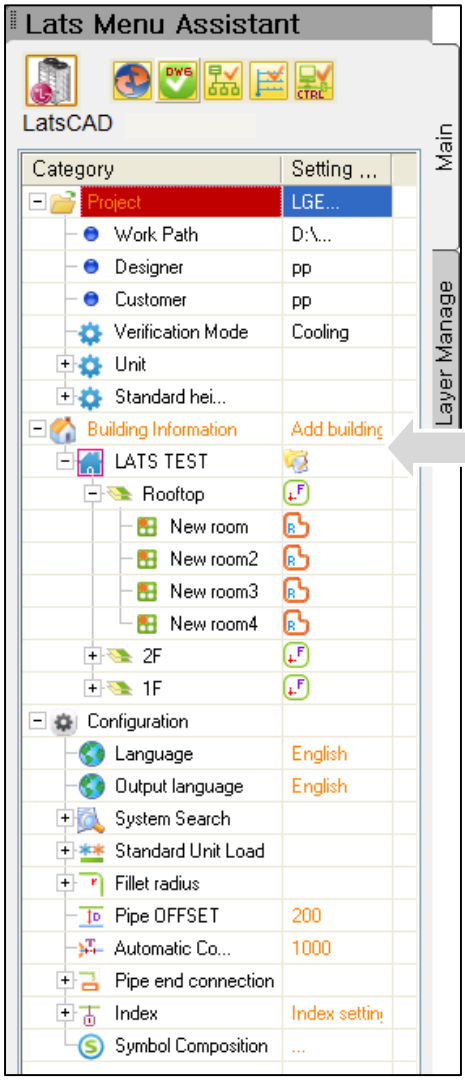
- Utilize LGE LATSCAD → Show Master Menu/Show Symbol Menu in Pull Down Menu

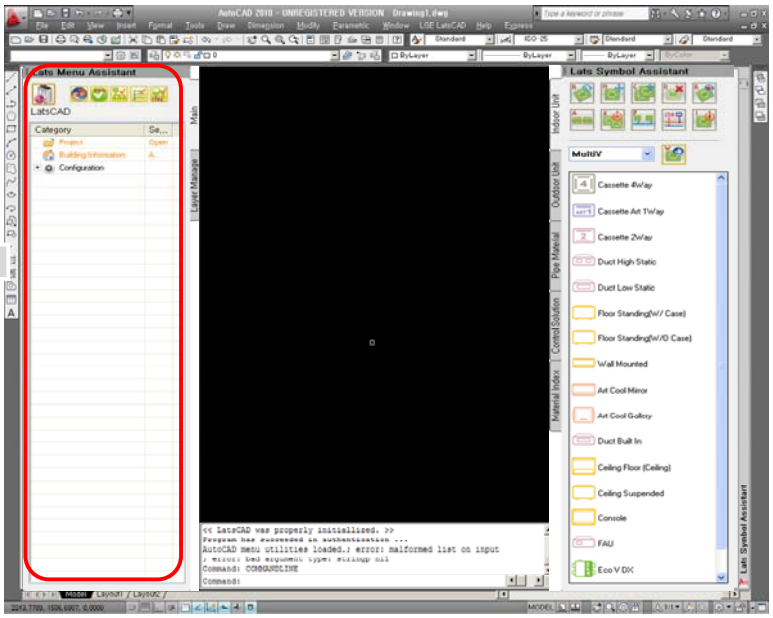


Main Tab

Master Tab is in Master Pane.

Project Information, Building Information, and Environment Setting Information can be viewed.

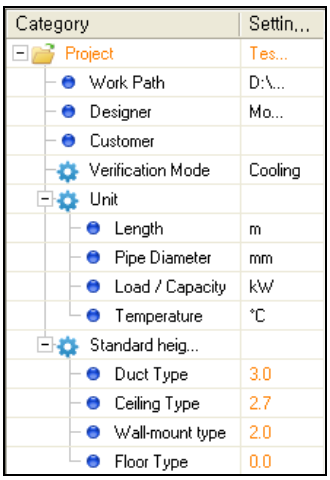




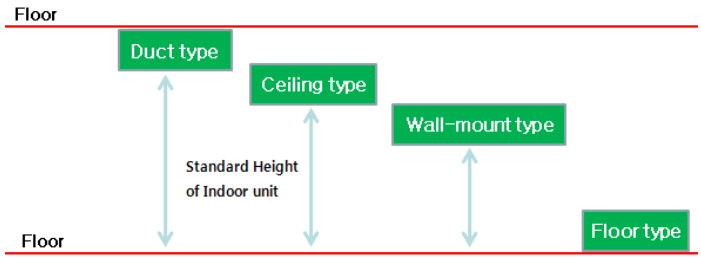
Environment Setting

It can set the environment of the project.

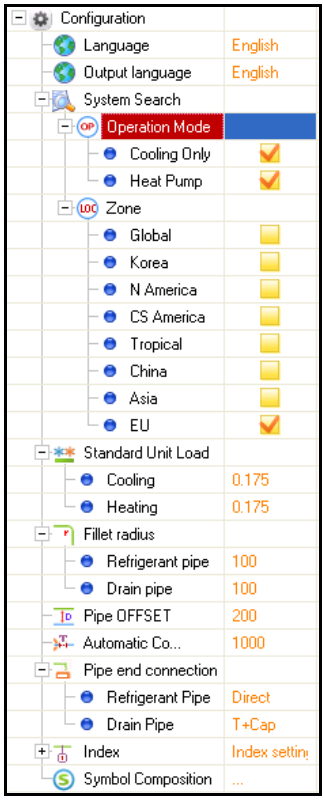
1. Project



- Verification mode: System Check Verification Mode (Now, this function can't invalid.)
- Unit: Units of Length, Pipe Diameter, Load / Capacity, and Temperature (Now, this function can't invalid.)
- Standard Height Indoor Unit: Apply the height from the floor for each indoor unit type



2. Configuration



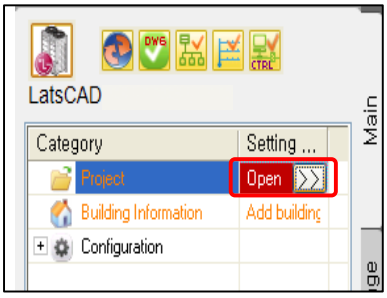
- Language: Korean, English, French, Spanish, Italian, and German. (CAD needs to be started again if changed)
- Output language: Korean, English, French, Spanish, Italian, and German. (Change Output or Remarks Data)
- System Search: Base Combination Ratio during the selection of Outdoor Unit (Mark the Models within the verification maximum/minimum boundary in blue color)
- Zone: Change Model name for each Product according to the selected region
- Standard Unit Load: Calculate automatically Room Load by Standard Unit Load
- Fillet Radius: Radius of the automatic round of Refrigerant Pipe and Drain Pipe
- Pipe OFFSET: Offset Distance of Refrigerant Pipe during Parallel Path Piping

Caution! Check Zone of System Search to change Model name for each Product according to the selected region.

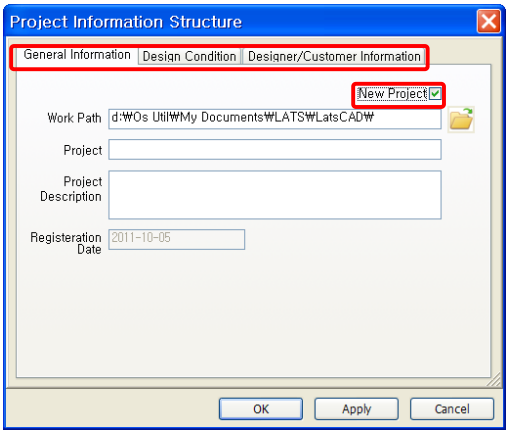
Project Information

Create New Project or open Project.

1. Select "Open" of Project in Master Pane.



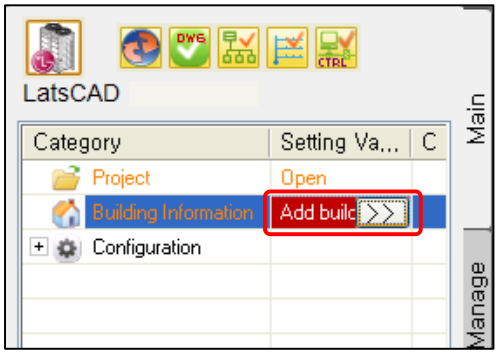
2. Select New Project and input Various Information



Space Information

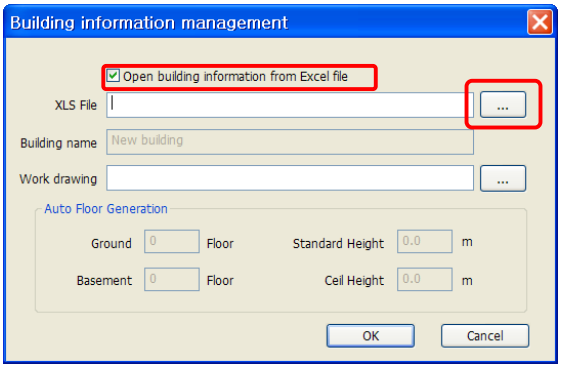
Create Building Space Information, Buildings, Floors, and Rooms, and manage Information.

1. Create Buildings

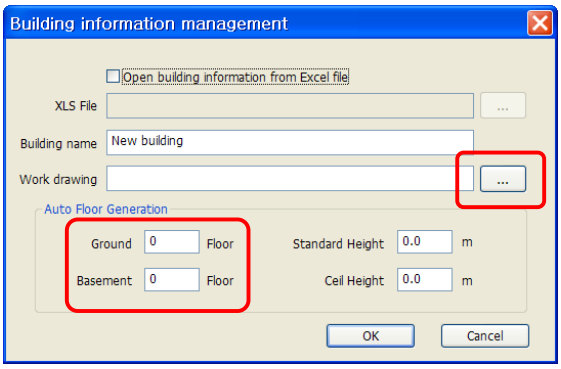


1.1 Open the Building Information from Excel File.

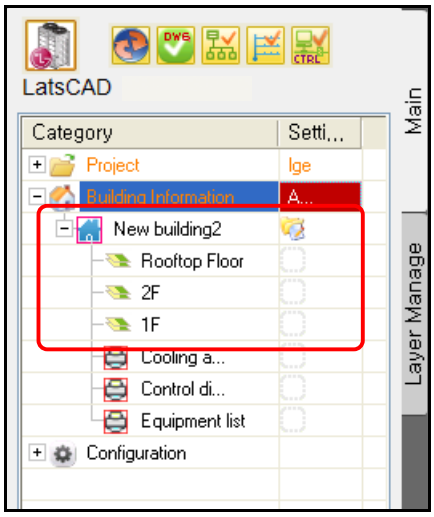
- Select Excel File and the Drawing



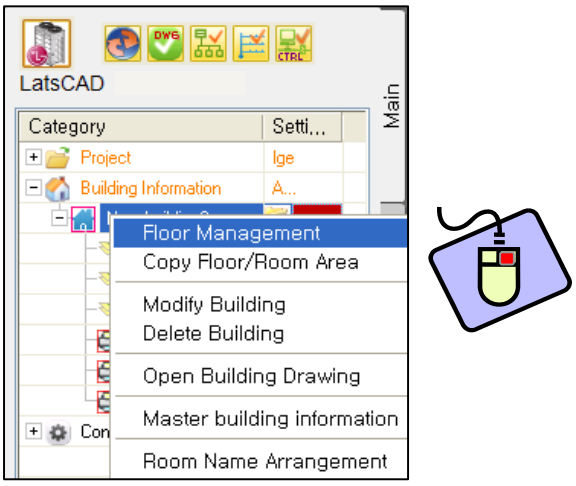
1.2 When there is no Excel Information, input Building Information and select Drawing selection.



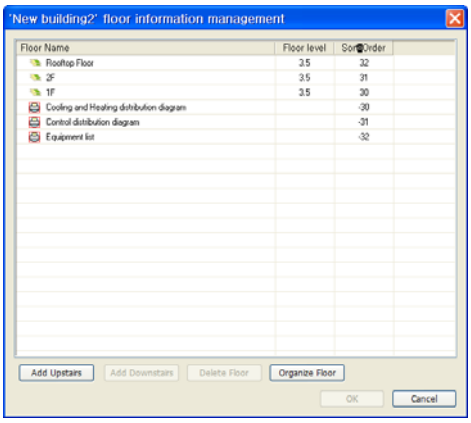
- "New building" Building is created.



2. Building Management (Mouse Right button while Building is selected)

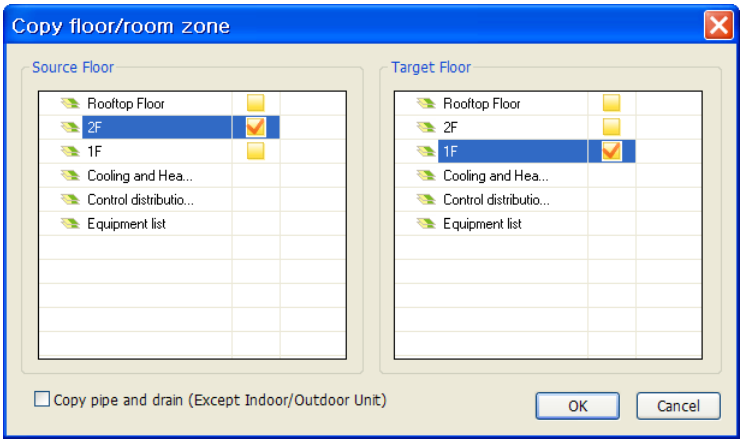


2.1 Floors may be added or deleted, and floor name and floor height information may be input for the corresponding building.

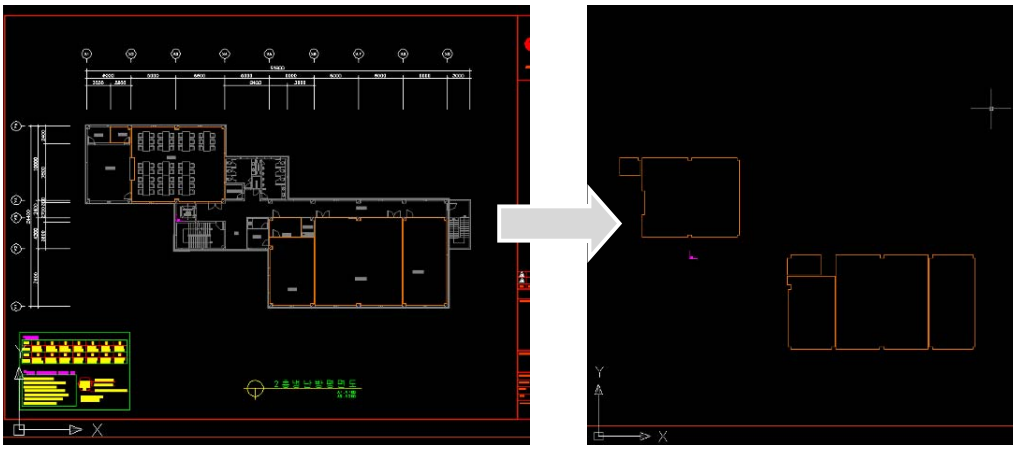


2.2 Copy Floor/Room Area: If there is the same format Room in another floor, Room Area Information may be copied and used.

2.2.1 Select the Source floor to copy and the target floor.



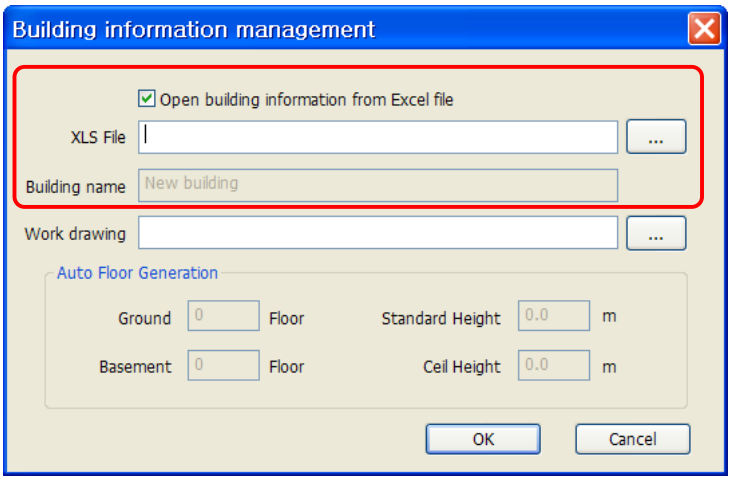
2.2.2 Room Area Information in the underground 1st floor is copied to the 2nd floor.



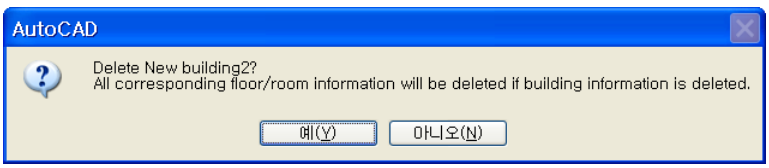
Caution! The Floor Area and the Reference Point must be set in the target floor.

Caution! Copy Floor/Room Area can not copy equipment.

2.3 Modify Building: It updates Building Information. (Building name and Drawing connections may be updated.)



2.4 Delete Building: It deletes the entire building.

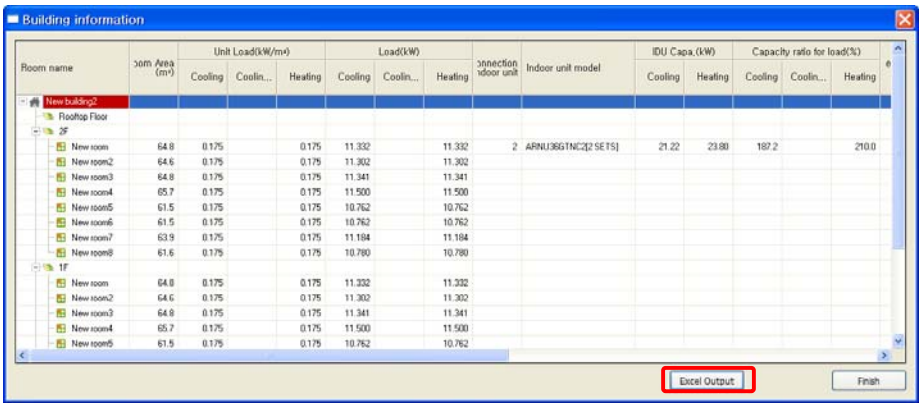


2.5 Open Building Drawing: It opens the drawing connected to the building.

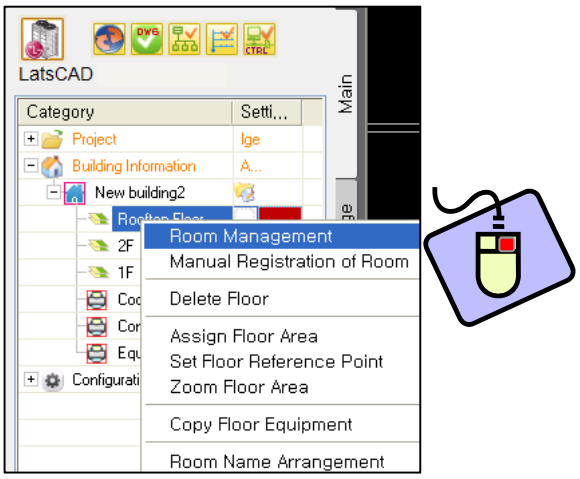
(For the existing Project File, Drawing is also automatically opened when the Project is opened.)

2.6 Master Building Information: Information for equipments positioned in the drawing may be verified and output to Excel.

(Load value for each Type may be verified)



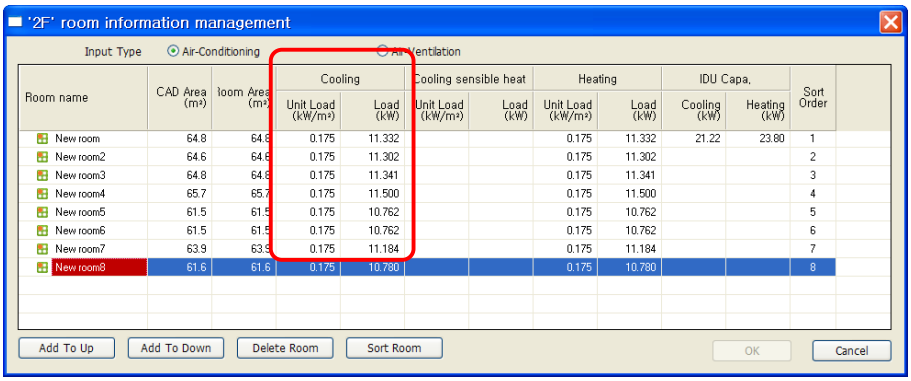
3. Floor Management (While the floor is selected, Mouse right button)



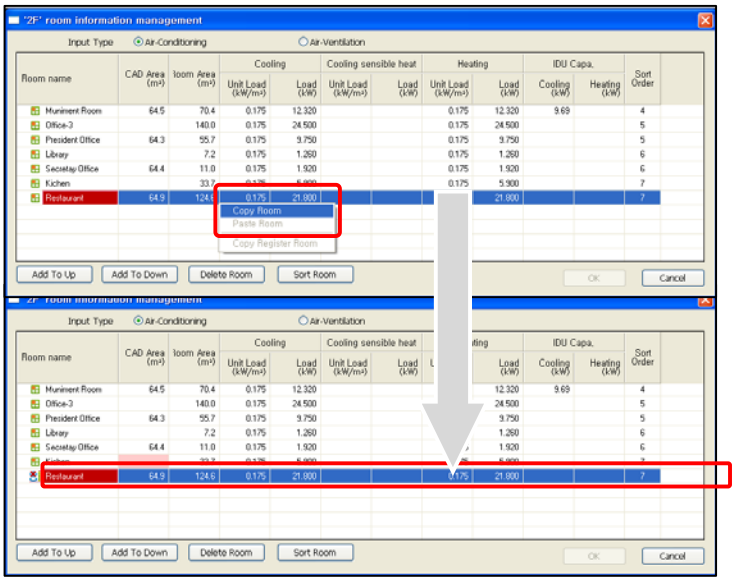
3.1 Room Management: Rooms may be added or deleted, and load and area values may be input.

- If load value is already input, apply the load value.

- If load value is not input, decide the load value by the unit load value.



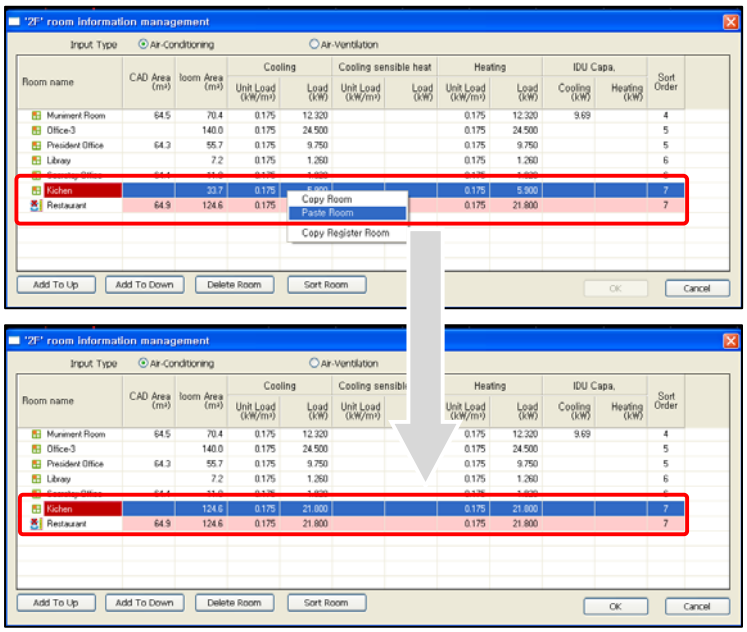
3.1.1 Room Copy: After selecting the Room to copy, select Copy Room



3.1.2 Paste Room: Select the existing Room to change after Copy Room, and select Paste Room of Mouse right button → Only Property Information is copied

Caution! This Paste Room function is only available, when select Paste Room of Mouse right button at existing Room. If you want to paste room in new room, use Copy Register Room function.

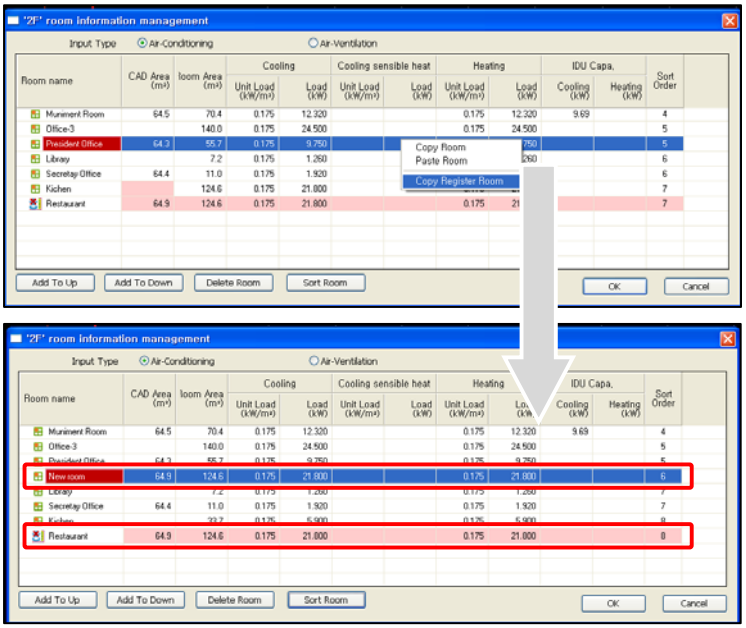
Example) Restaurant room data Copy and, Paste information of Restaurant room at Kitchen room.



3.1.3 Copy Register Room: After Copy Room, Select Copy Register Room of Mouse right button at a room desired placing new room.

- A new Room is created under selecting room, and the Property Information is also copied.

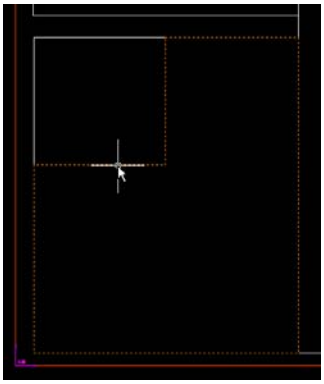
Example) Restaurant room data Copy and, select Copy Register Room at President Office.



3.2 Manual Registration of Room

Manual Registration of Room is run in the order of Generate Room Area, Modify Room Information, and Auto-arrange Indoor Unit.

3.2.1 Generate Room Area: Select Room Area in the drawing, and input Room Information Management

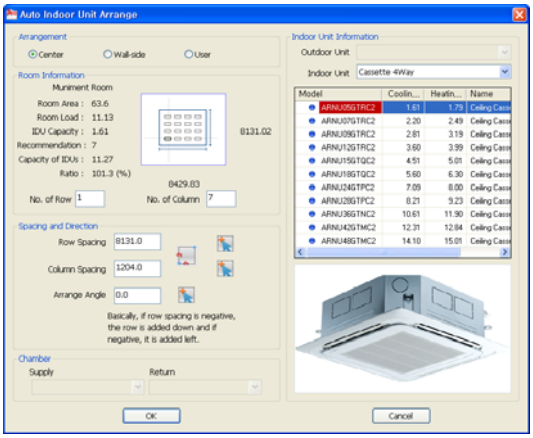


```
Apoint border start point of 'Rooftop Floor New room' or
[Select(S) ] :
```

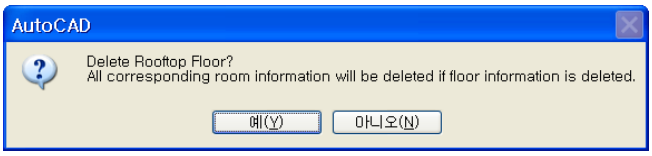
3.2.2 Modify Room Information: Input Room Information Management.

Caution! When change the values (Room Area, Unit Load, and Load), Please click the "Calc."

3.2.3 Auto-arrange Indoor Unit: Select Indoor Unit in the room automatically.



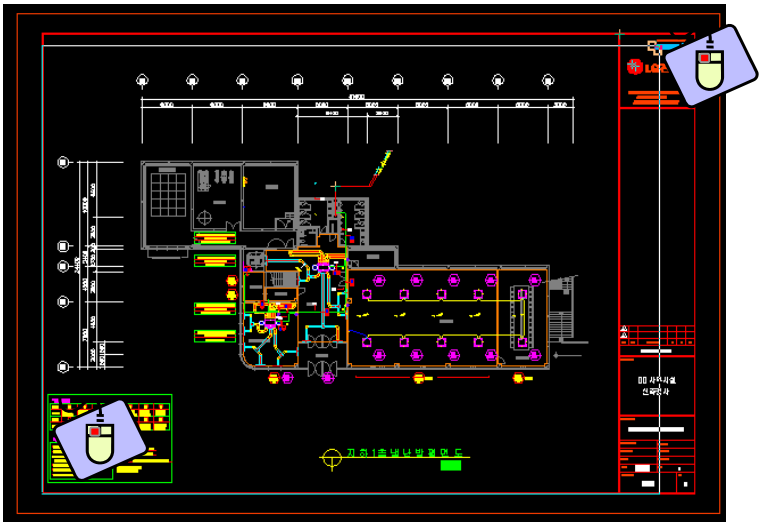
3.3 Delete Floor: It deletes the corresponding floor completely.



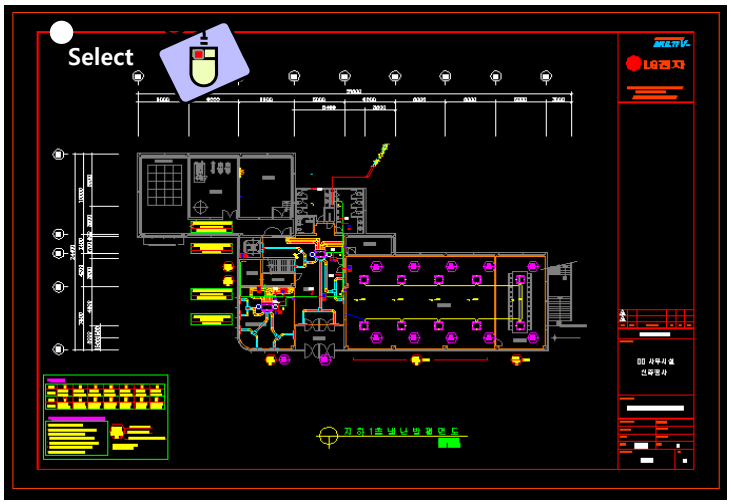
3.4 Assign Floor Area: It designates the floor area in the drawing.

```
Apoint border start point of '2F' or [Select(S) ] :
```

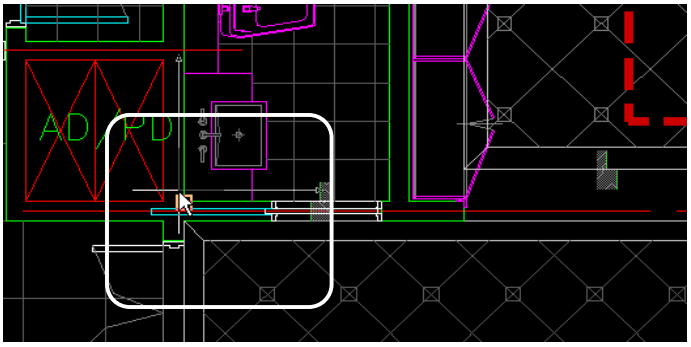
- Designate the floor area with a rectangle (R) or poly line (P)



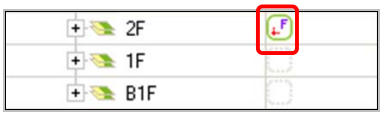
- Select (S): Select a closed area and designate as the floor area



3.5 Set Floor Reference Point: Designate the floor reference point in the drawing.

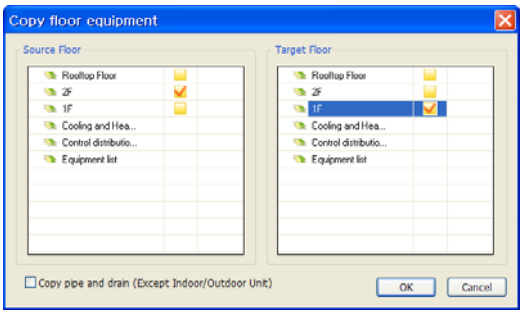


- When the floor area and the reference point are designated, the color of the floor icon in the left is updated.



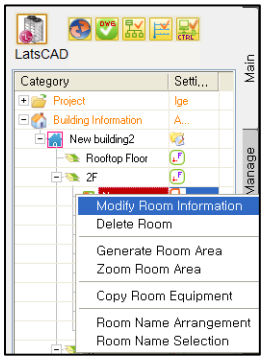
3.6 Zoom Floor Area: Expand and show the corresponding floor in the screen.

3.7 Copy Floor Equipment: copies the equipments of the selected floor to the target floor.

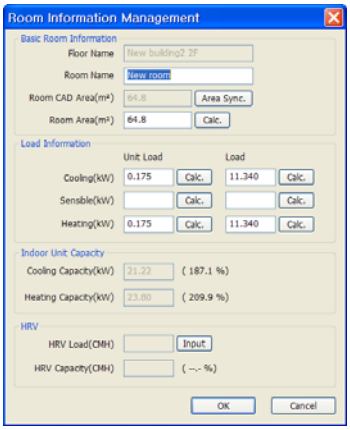


Caution! Copy Floor Equipment can not copy Room Area.

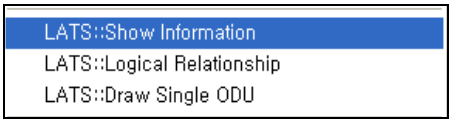
4. Room Management (While the Room is selected, Mouse right button)



4.1 Modify Room Information: Basic Information of the corresponding Room may be updated.

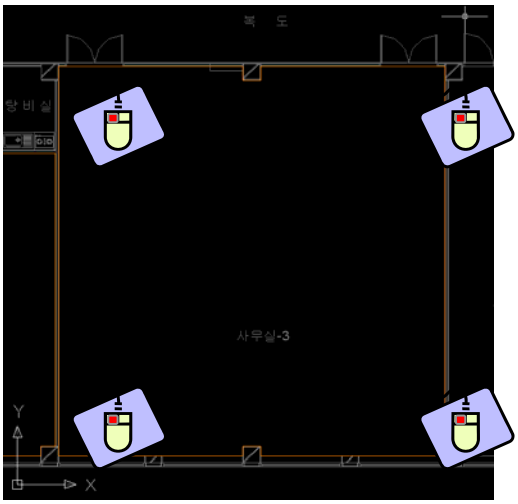


- It is same as LATS::Show Information (After selecting room area in the drawing, Mouse right button)



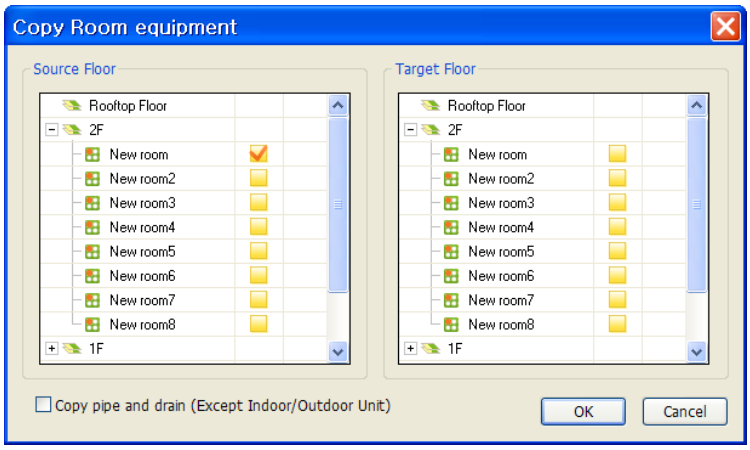
4.2 Delete Room: It deletes the corresponding Room completely.

4.3 Generate Room Area: It designates the Room Area. (The method of area designation is the same as Assign Floor Area of Floor Management.)



4.4 Zoom Room Area: It expands the designated room.

4.5 Copy Room Equipment: copies the equipments in the selected room to the target floor.

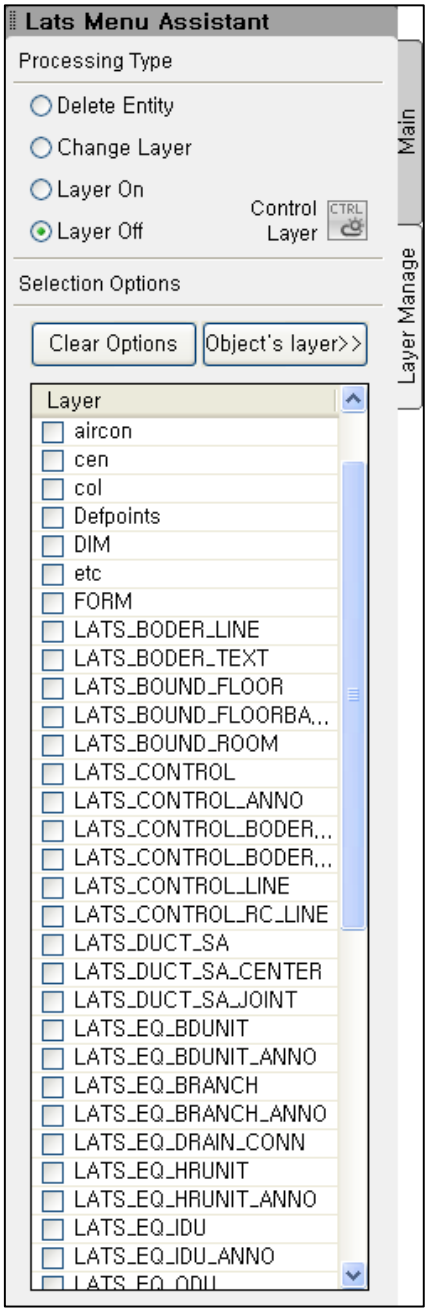


Caution! Copy Floor Equipment can not copy Room Area.

Layer Tab

Layer Tab is in Master Pane.

Layer change and delete, and On/Off functions may be used.

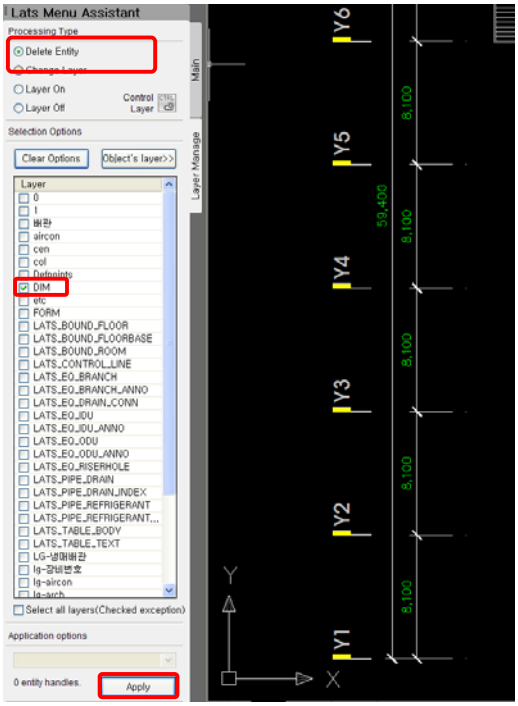


- Delete Drawing Element: It deletes the drawing elements of the selected Layer.
- Change Layer: It moves the drawing elements of the selected Layer to a certain Layer.
- Layer On: It makes the selected Layer to be seen.
- Layer Off: It hides the selected Layer not to be seen.
- Using the Object Layer Selection Option of the Selection Option, an object of CAD screen may be selected to select the Layer.
- If Apply is clicked, the work classification contents will be applied.

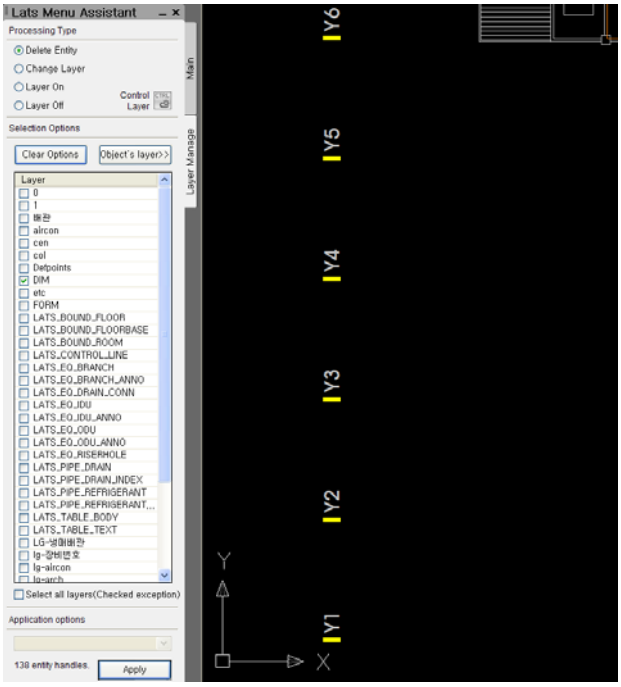
Delete Drawing Element

1. Select Delete Drawing Element in work of Layer Pane.

2. Select Layer in Option, or select the object in the drawing in Object Layer Selection.

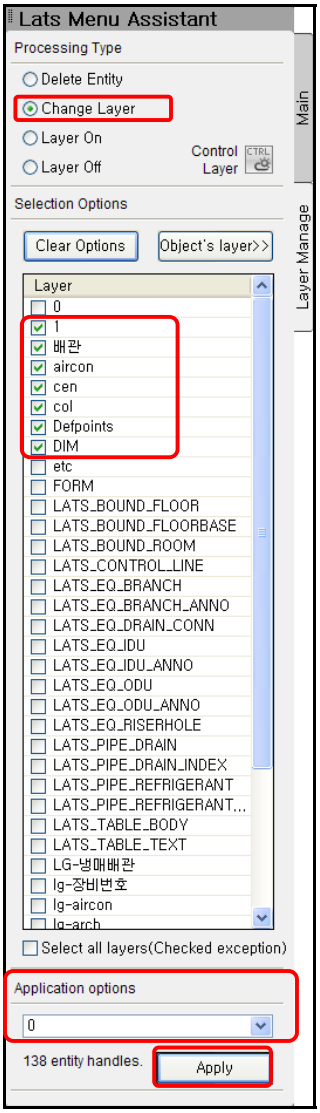


3. The Drawing Elements of the selected Layer are deleted.



Change Layer

It moves the drawing elements of the selected Layer to a certain Layer.



If Apply is clicked, the drawing elements of the selected Layer are moved to the Change Option Layer.

Layer On/Off

It hides the drawing elements of the Layer of Selection Option, or shows the hidden elements.

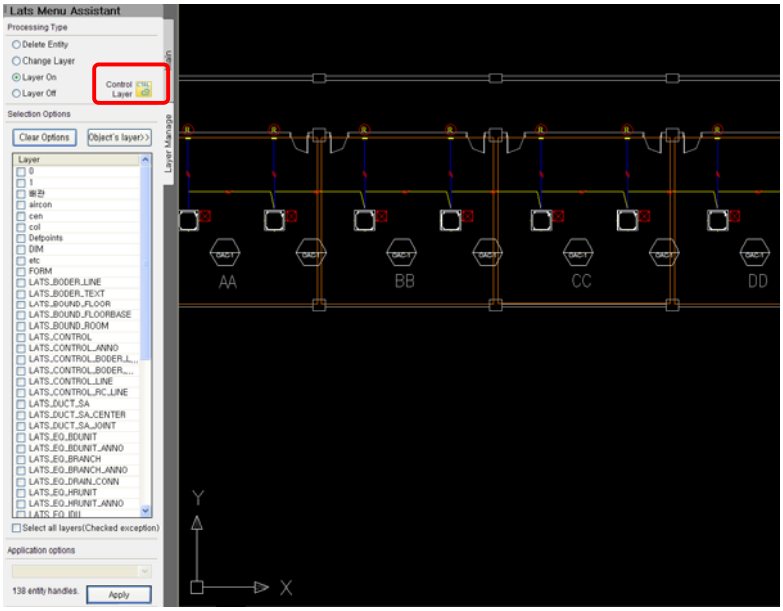
The operation method is the same as the Drawing Element Deletion above.

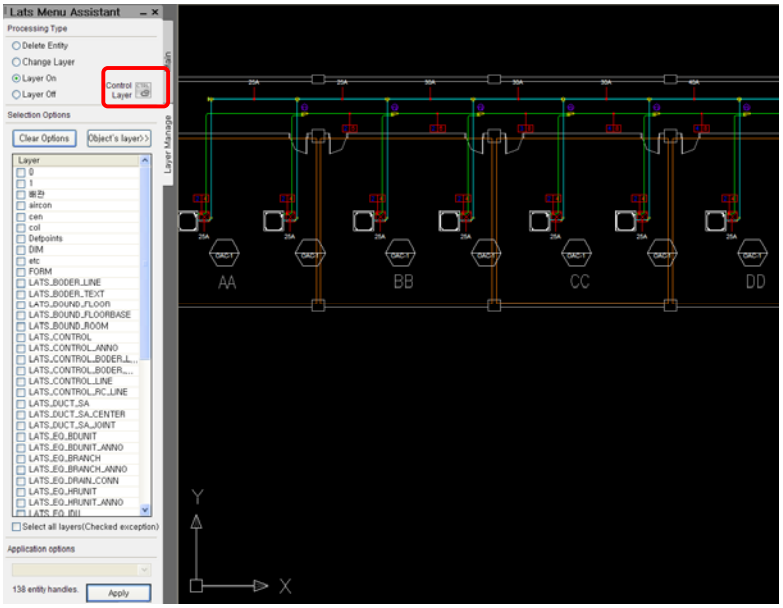
Control Layer On/Off

It On/Offs only the used Layers of the Control drawing.

When it is selected, only Control Layer is On, and the remaining LATS Layers are Off

(If it is selected again, Control Layer is Off, and the remaining LATS Layers are On)





Indoor Unit Tab

Indoor Unit Tab is in Symbol Pane.

Indoor Units may be positioned in the drawing.

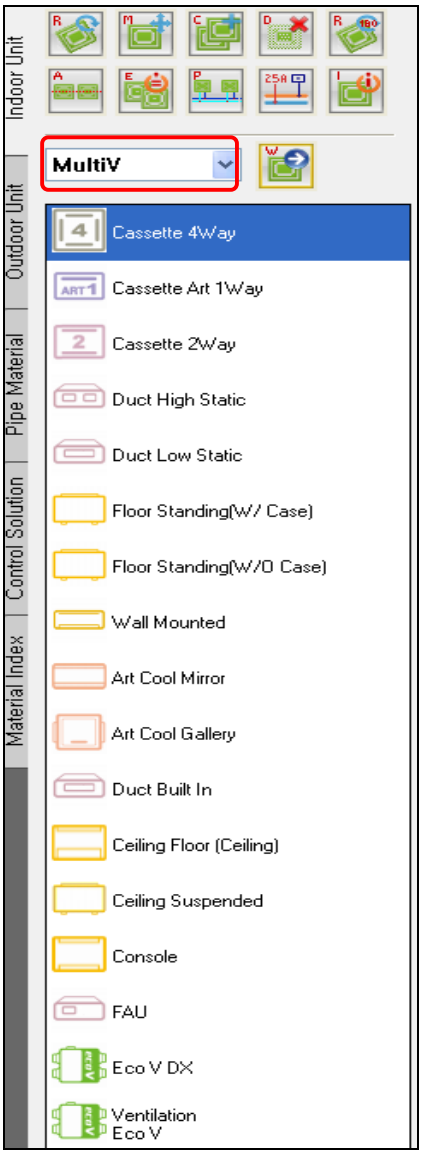
1. Select Indoor Unit Type in the Indoor Unit tab of Symbol Pane. (For Single, when the Indoor Unit is positioned, Outdoor Unit is immediately referenced and positioned.)

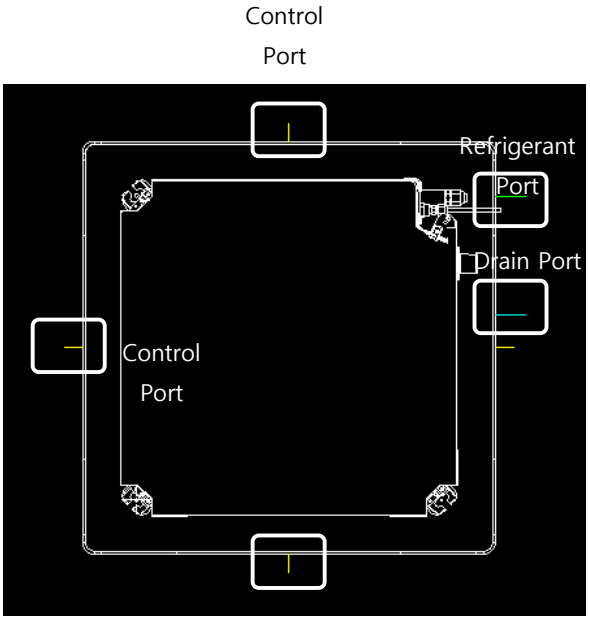
2. Double click the desired Indoor Unit Type.

3. Select the desired Indoor Unit Model, and press Enter.

4. Click at desired position in the drawing, and select direction of refrigerant port and drain port.

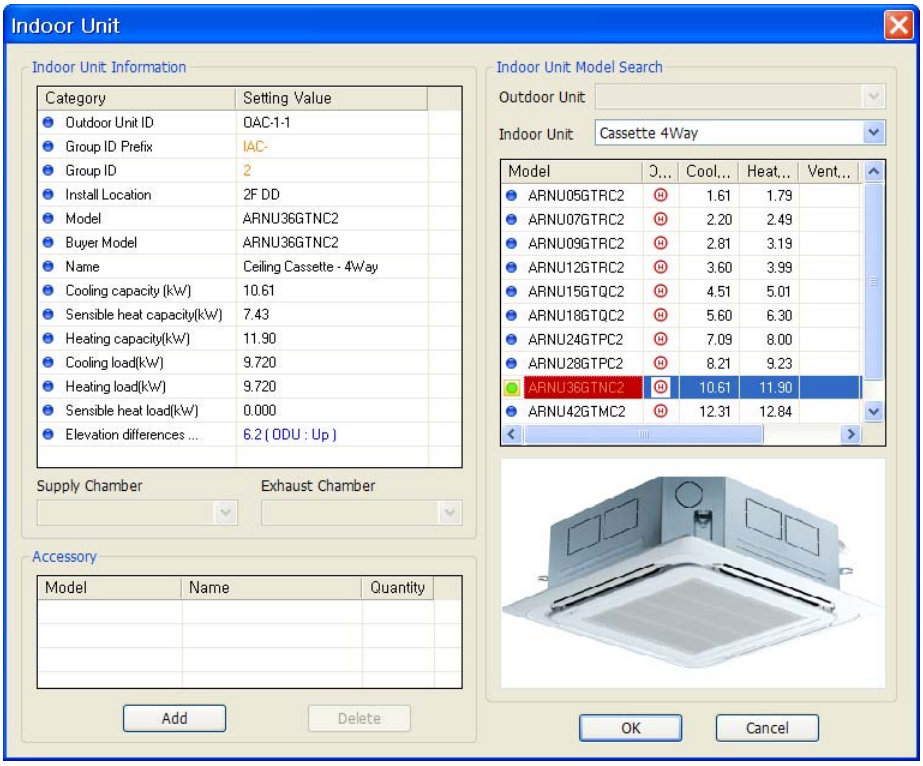
5. Press Enter to finish.





Indoor Unit Information

If Double click the desired Indoor Unit Type, can check Indoor Unit Information.



1. Indoor Unit Information

- Outdoor UnitID: connected Outdoor Unit ID. (Assigned automatically when insert the Equipment table)

- GroupID Prefix (Assigned automatically when insert the Equipment table)

- Group ID: Indoor Unit Group ID. (Assigned automatically when insert the Equipment table)

- Installation Location: Indoor Unit Installation Location.

- Model: Indoor Unit Model Name.

- Name: Indoor Unit Type

- Cooling Capacity (KW): Cooling Capacity.

- Sensible Heat Capacity (KW): Sensible Heating Capacity.

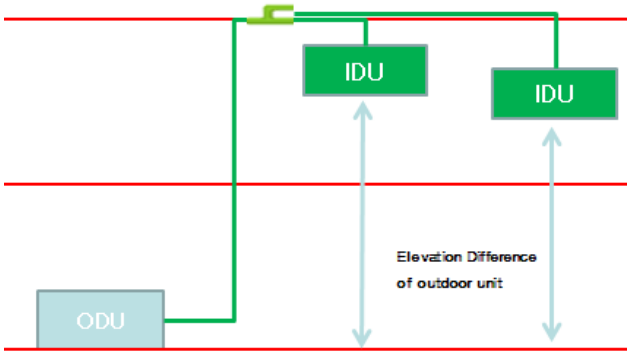
- Heating Capacity (KW): Heating Capacity.

- Cooling Load (KW): Cooling Load of the positioned room.

- Heating Load (KW): Heating Load of the positioned room.

- Sensible Heating Load (KW): Sensible Heating Load of the positioned room.

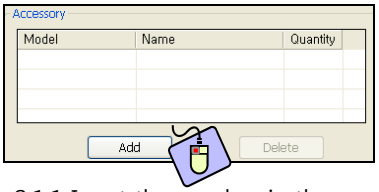
- Elevation Difference of outdoor unit (m): Height Difference with the connected Outdoor Unit.(Calculate automatically)



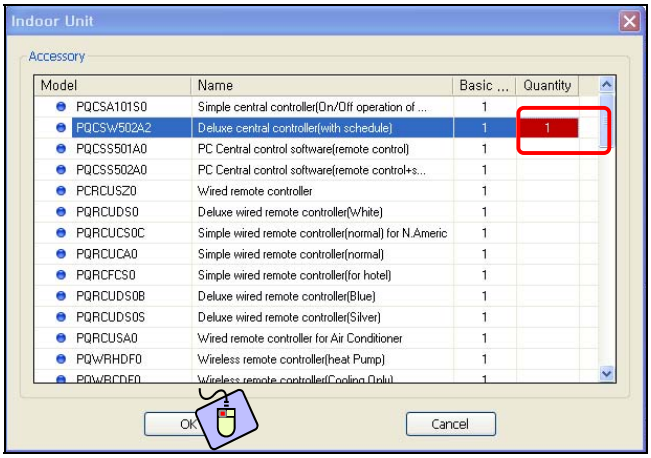
2. Accessory

- List of the accessories added to Indoor Unit.

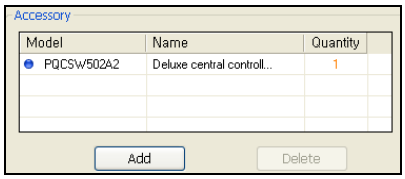
2.1 Add Accessory



2.1.1 Input the number in the accessories list, and click "OK".


Indoor Unit
Accessory
Model
Name
Basic ...
Quantity
PQCSA101S0 Simple central controller(On/Off operation of ... 1
PQCSW502A2 Deluxe central controller(with schedule) 1 1
PQCSS501A0 PC Central control software(remote control) 1
PQCSS502A0 PC Central control software(remote control+s... 1
PCRCUSZ0 Wired remote controller 1
PQRCUDS0 Deluxe wired remote controller(White) 1
PQRCUCS0C Simple wired remote controller(normal) for N.Americ 1
PQRCUCA0 Simple wired remote controller(normal) 1
PQRCFCS0 Simple wired remote controller(for hotel) 1
PQRCUDS0B Deluxe wired remote controller(Blue) 1
PQRCUDS0S Deluxe wired remote controller(Silver) 1
PQRCUSA0 Wired remote controller for Air Conditioner 1
PQWRHDF0 Wireless remote controller(heat Pump) 1
OK
Cancel

2.1.2 Accessories are added.

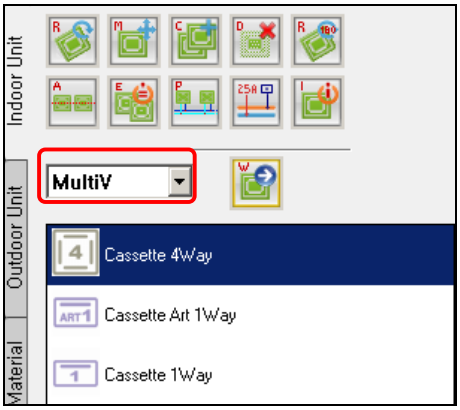


3. Indoor Unit Model Search.

- Indoor Unit may be selected by filtering with Outdoor Unit type and Indoor Unit type.

Positioning for each Product Type

1. MultiV and Multi



1.1 Select Indoor Unit tab in Symbol Pane

1.2 Select Product Type

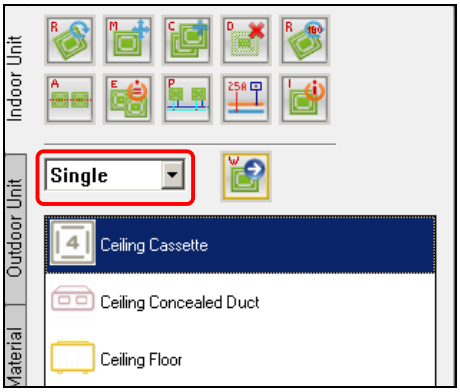
1.3 Select the desired Product Model, and press Enter

1.4 Click at desired position in the drawing, and select direction of refrigerant port and drain port

1.5 Press Enter to finish

Caution! For Multi Product, first select and position Outdoor Unit and then select Indoor Unit.

2. Single



2.1 Select Indoor Unit tab in Symbol Pane

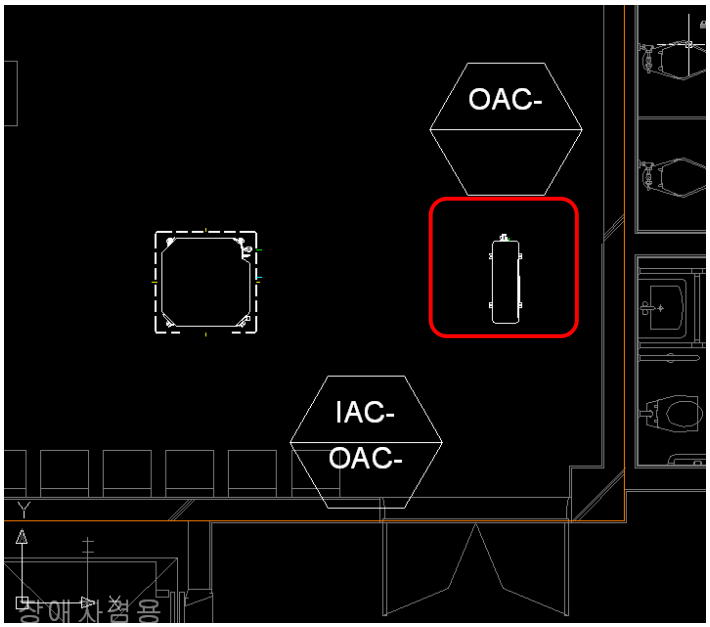
2.2 Select Product Type (Single)

2.3 Select the desired Product Model, and press Enter

2.4 Click at desired position in the drawing, and select direction of refrigerant port and drain port

- After positioning Indoor Unit, position Outdoor Unit by referring to the location of the positioned Indoor Unit

2.5 Press Enter to finish



Caution! Single Type is positioned from Indoor Unit Positioning stage to Outdoor Unit at once.

Outdoor Unit Tab

Outdoor Unit Tab is in Symbol Pane.

Outdoor Unit may be positioned in the drawing.

1. Select Product Type in the Outdoor Unit Tab of Symbol Pane.

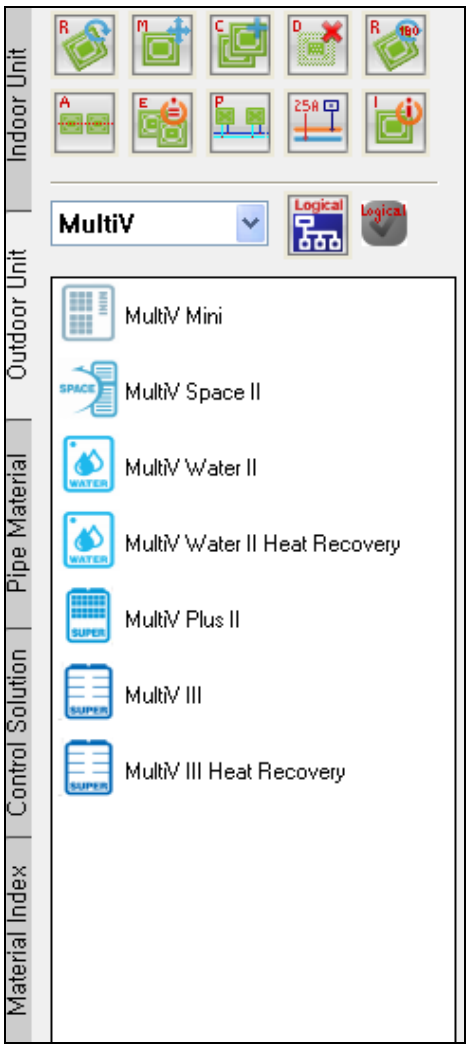
(For Single, there is no Outdoor Unit Type to be selected separately.)

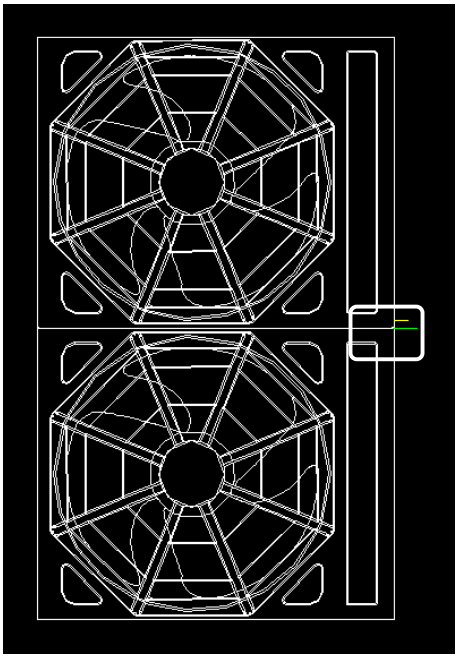
2. Double click the desired Outdoor Unit Type, and press Enter.

3. Select the desired Outdoor Unit Model.

4. Click at desired position in the drawing, and select direction of refrigerant port

5. Press Enter to finish.





Refrigerant and Control Port

IDU Logical Relationship

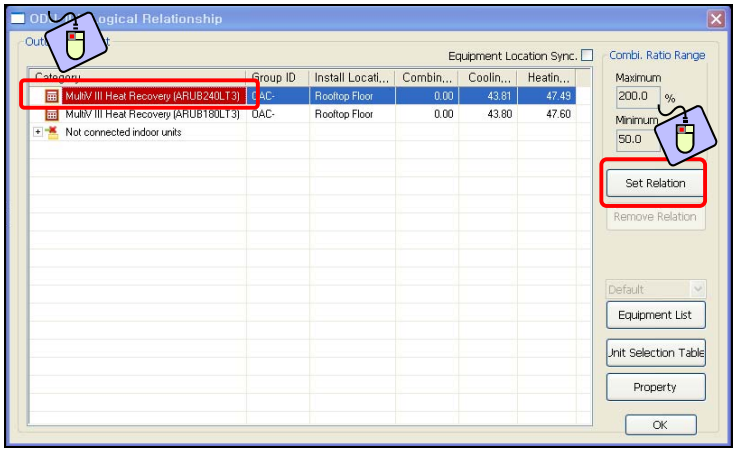
1. Select the IDU Logical Relationship Menu in Outdoor Unit Tab of Symbol Pane.

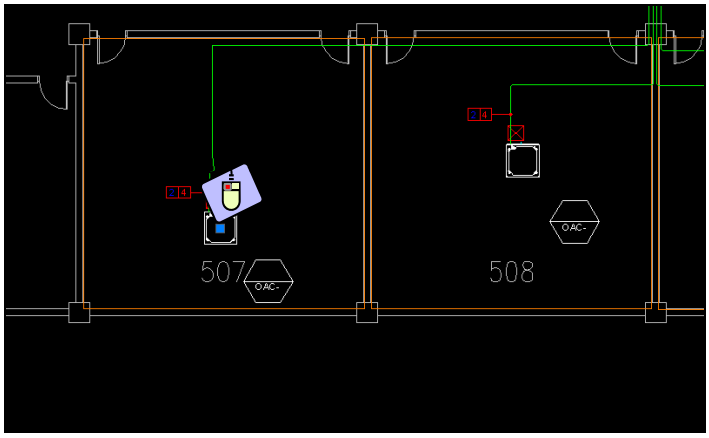
2. The ODU to set relation is selected in Category, and click Set Relation Button.

3. Select the IDU in drawing, and press Enter.

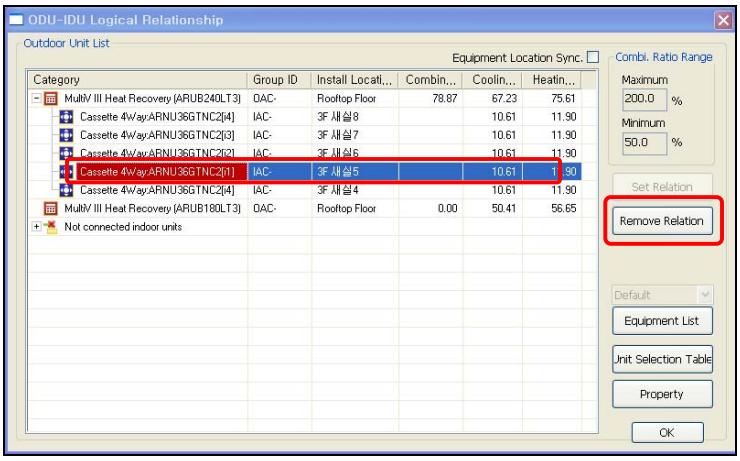
Caution! when click Set Relation Button, IDU Logical Relationship window is closed temporarily.

4. Connect the IDU low lank selected ODU.





5. When click Remove Relation with selecting IDU in Category, can cancel Relation with ODU



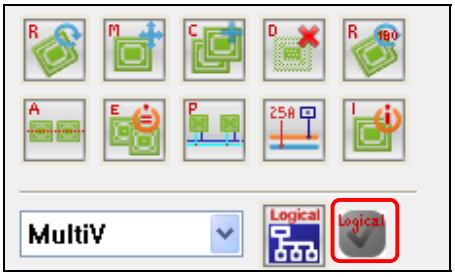
Logical Relationship Mode

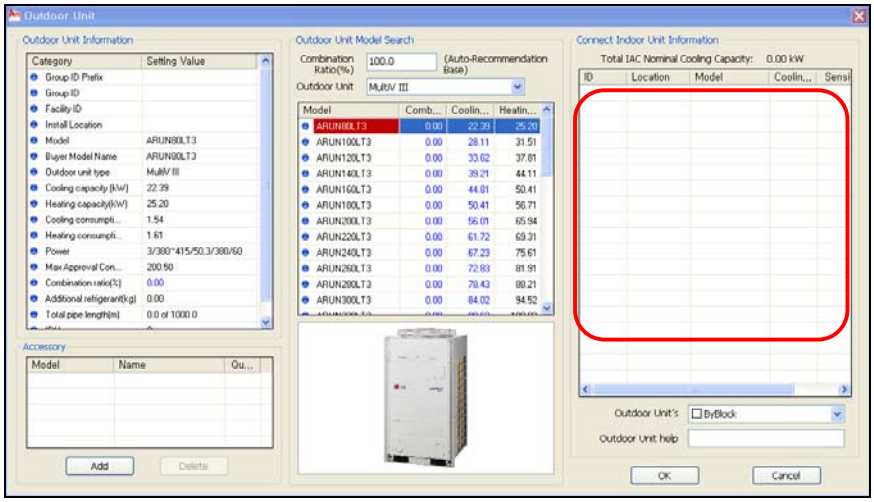
When select On/Off IDU Logical Relationship Mode, Possible check logical relationship.

After set On/Off, When run information.

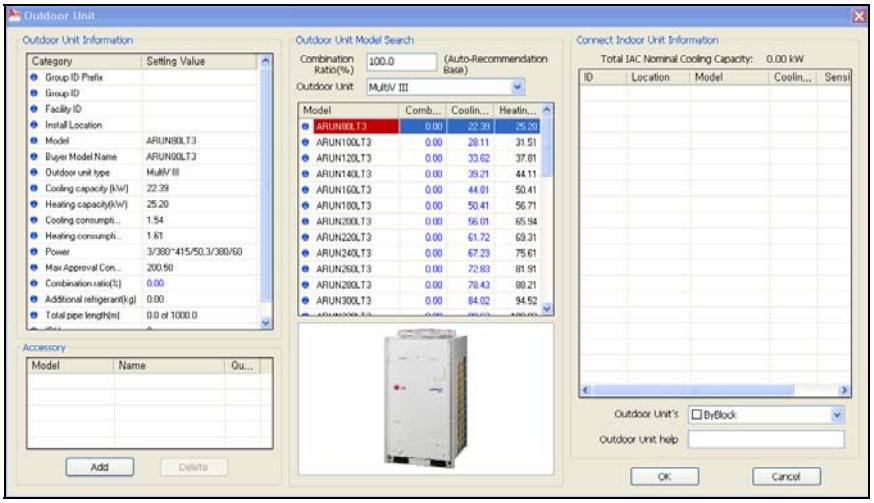
1. When set On: Show only logical relationship can't show real piping connection.

2. When set Off: Show only real piping connection.





Outdoor Unit Information



1. Outdoor Unit Information

- GroupID Prefix: GroupID Prefix value Setting (Assigned automatically when insert the Equipment table)
- GroupID: Group ID for each Model. (Assigned automatically when insert the Equipment table)
- Facility ID: Facility ID for each Group. (Assigned automatically when insert the Equipment table)
- Installation Location: Location where Outdoor Unit is installed.
- Model: Model Name
- Outdoor Unit Type: Outdoor Unit Type Information
- Cooling Capacity (KW): Cooling Capacity
- Heating Capacity (KW): Heating Capacity
- Cooling Power Consumption (KW): Cooling Power Consumption

- Heating Power Consumption (KW): Heating Power Consumption

- Power: Outdoor Unit Power.

- Combination Ratio (%): Combination Ratio with the connected Indoor Unit.

- Additional Refrigerant Amount: Refrigerant Amount to be added (assigned at System Checking)

- Total Pipe Length (m): The length of all the Pipes connected to Outdoor Unit.

- IDU : The number of Indoor Units connected to the corresponding Outdoor Unit.

2. Outdoor Unit Model Search.

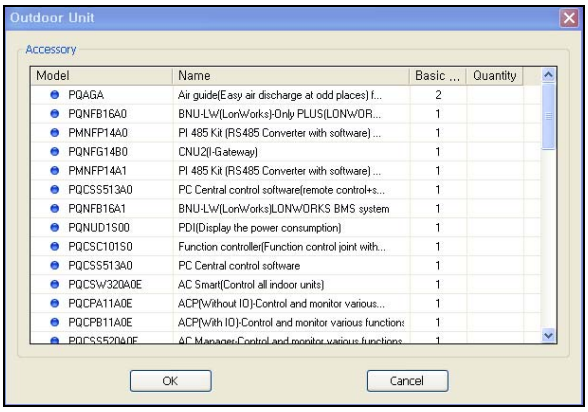
- Combination Ratio: Combination Ratio based on Automatic Recommendation (The value closest to the standard combination ratio comes up to the top of the blue color)

3. Connect Indoor Unit Information (Logical Mode).

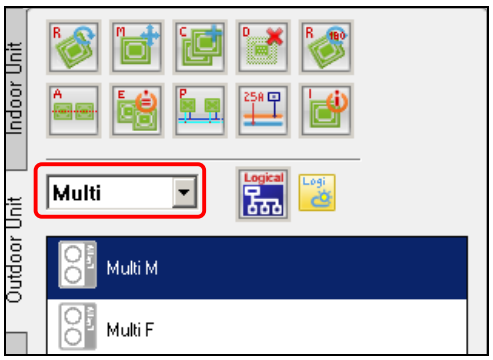
- It shows the location, Model name, and Capacity of the connected Indoor Unit.

4. Accessory

- It shows the list of the accessories added.



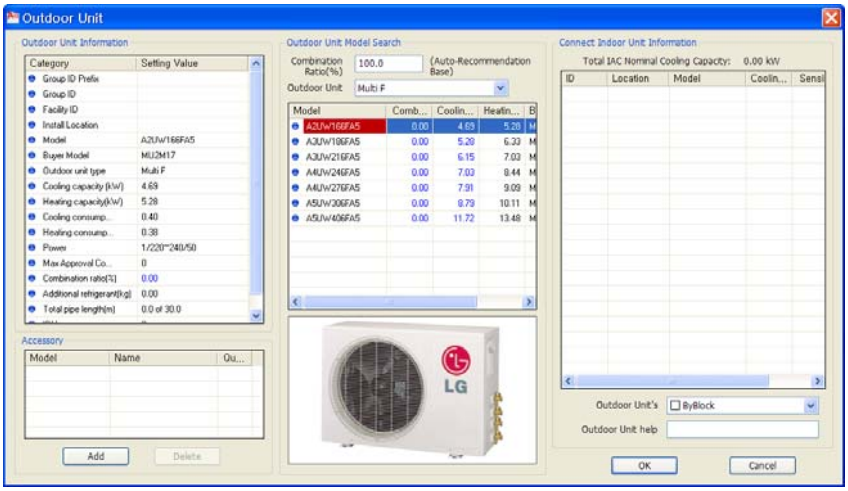
Multi Type Equipment Positioning



1. Select Outdoor Unit tab in Symbol Menu.

2. Select Product Type (Multi)

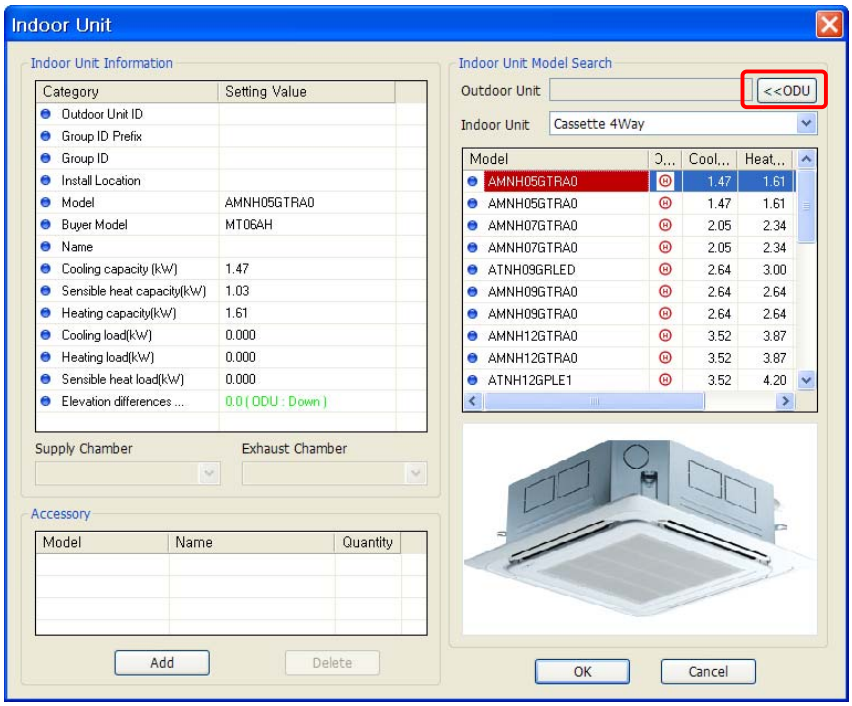
3. Select the desired Product format and Model.



4. Position them in the drawing.

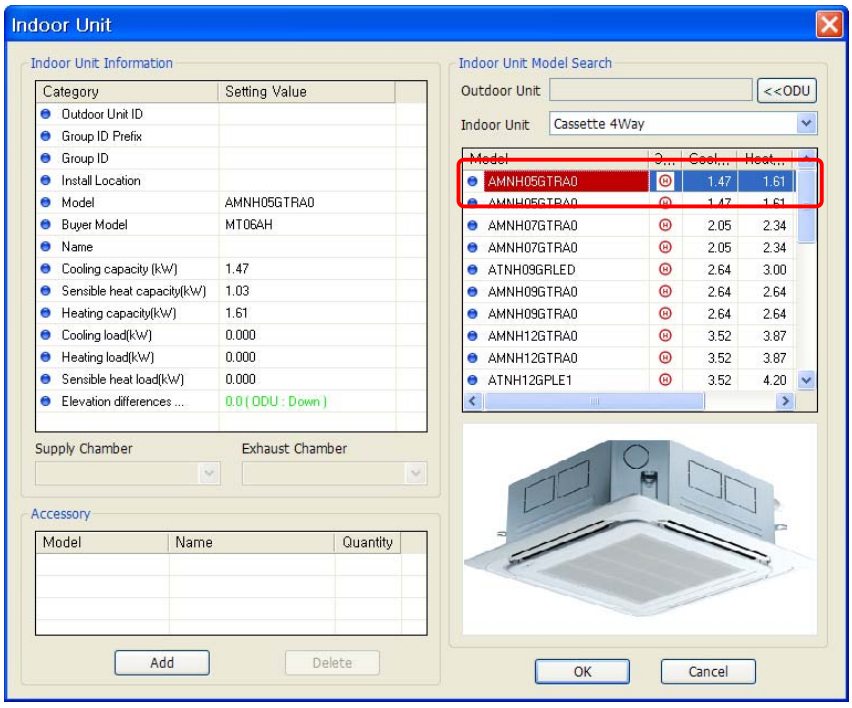
5. After selecting Multi of Indoor Unit tab, select the desired Indoor Unit Model.

6. Select ODU in Indoor Unit Model search categories.

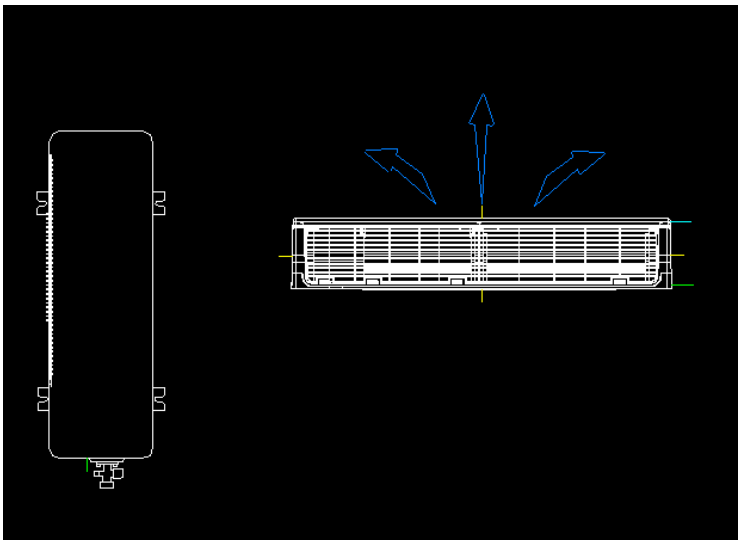


7. Select Outdoor Unit of Multi Type already positioned in the drawing.

8. Only the equipments that can be applied to the selected Outdoor Unit are sorted according to each Indoor Unit format

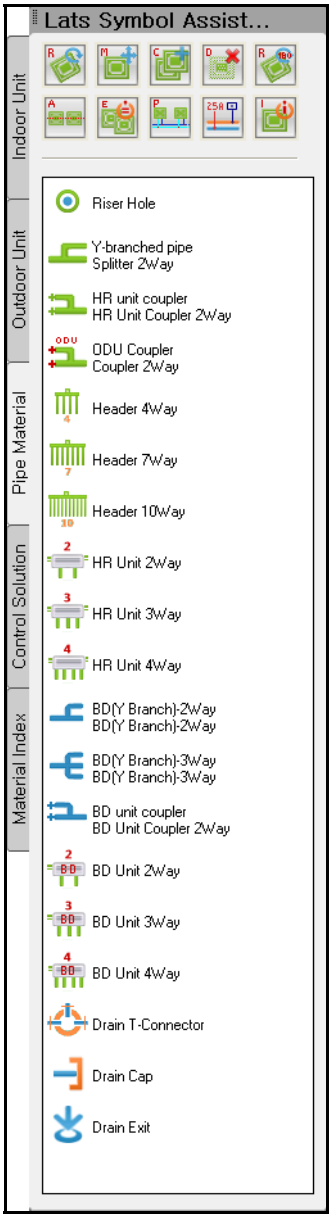


9. Select the desired Models among the sorted Indoor Unit equipments, and position them in the drawing.



Pipe Material Tab

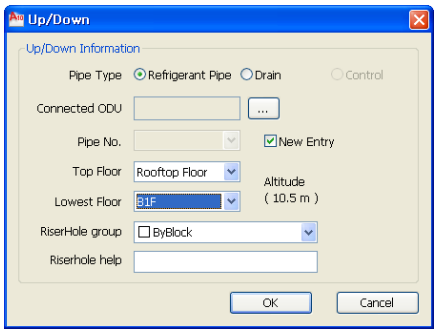
Riser Hole, Down Hole, and Pipe Material may be positioned in the drawing.



Riser Hole

1. select Riser Hole in Pipe Material of Symbol Pane.

2. Set Riser Hole Type.



- Pipe Type: Select the classifications of Refrigerant Pipe, Drain Pipe, and Control Line.

- Connected ODU: Connected Outdoor Units are displayed.

- Pipe No.: For new creation, check in the New Entry check box, and if extending the already positioned Riser Hole, select the corresponding Riser Hole.

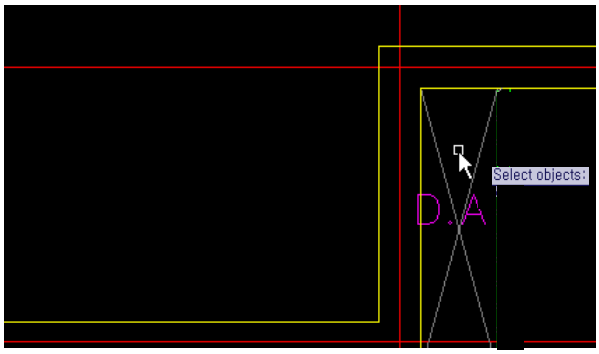
- Top Floor: Designate the highest floor.

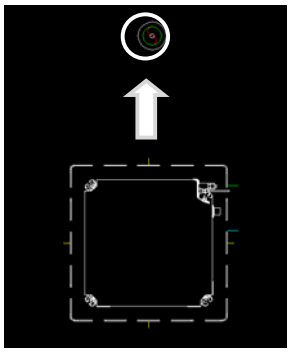
- Lowest Floor: Designates the lowest floor.

3. When reference positioning is selected

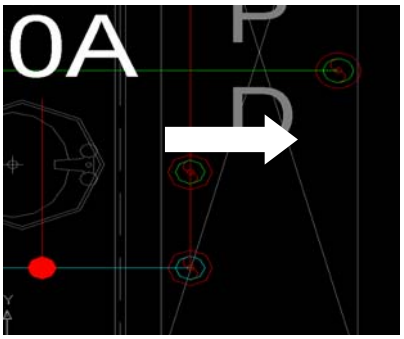
```
Select objects:
Assign the install location :
```

4. Select the desired location in the drawing and insert Riser Hole. Position it by selecting the equipment for the reference positioning.(Input the coordinates or drag)



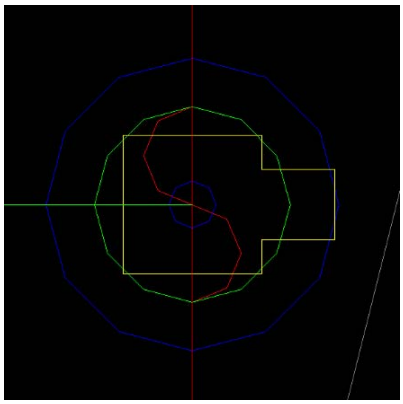


- Move Riser Hole: When it is moved, the Riser Holes in all the floors are moved the same. (They are equally deleted when it is deleted)



Example) For the Riser Hole connected from the 1st floor to the 5th floor,
If the Riser Hole in the 2nd floor is moved, the positions of the Riser Holes in all the floors are equally moved.

- Change of Riser Hole symbol branched vertically (after Drawing Check)

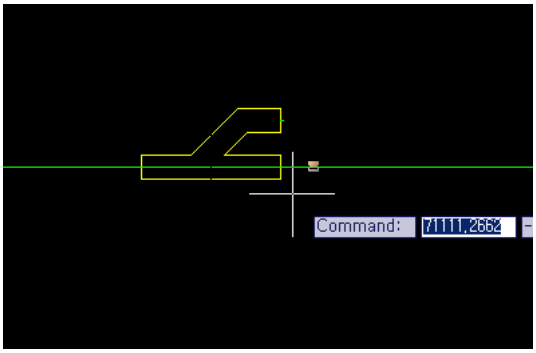


Y-Branched Pipe

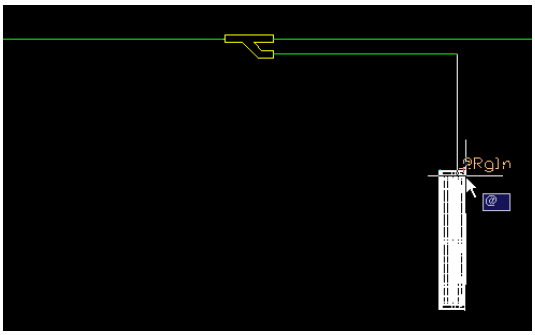
Y-Branched Pipe can use divide to Refrigerant Pipe.

1. Select Y Branched Pipe in Pipe Material of Symbol Pane.

2. Place Branched Pipe insertion point above Refrigerant Pipe, and select the branching direction.

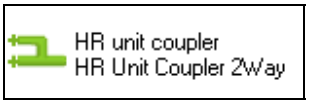


3. Connect from Branched Pipe to Indoor Unit Refrigerant Pipe Port using Piping Equipment Menu in Symbol Pane.

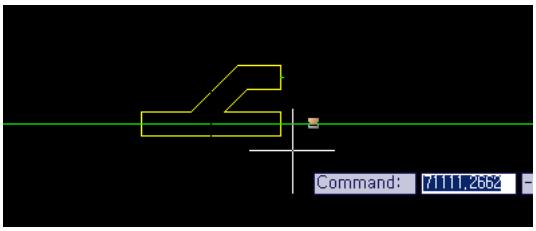


HR unit Coupler

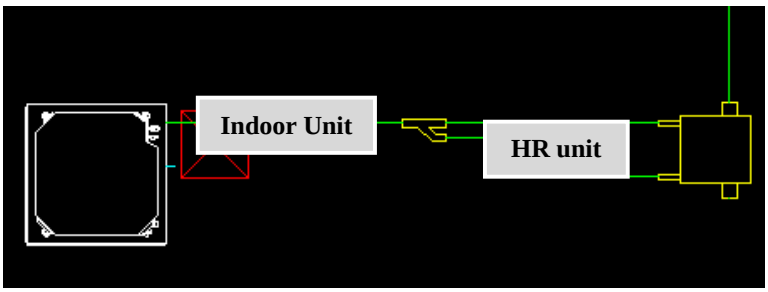
1. Select HR unit Coupler in Pipe Material of Symbol Pane.



2. Place HR unit Coupler insertion point above Refrigerant Pipe, and select the branching direction.

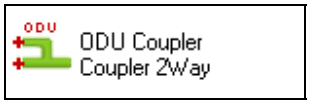


3. Connect from HR unit Coupler to Indoor Unit Refrigerant Pipe Port and HR unit Port using Piping Equipment Menu in Symbol Pane.

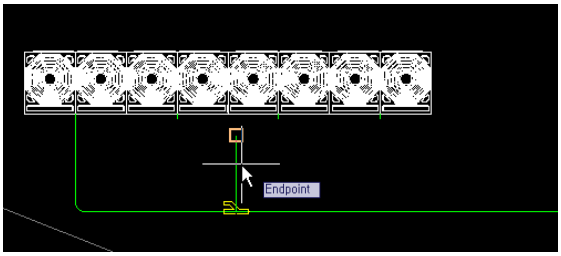


ODU Coupler

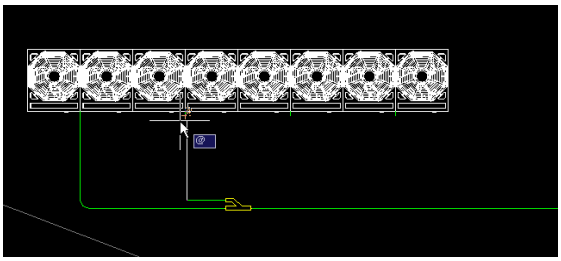
1. Select ODU Coupler in Pipe Material of Symbol Pane.

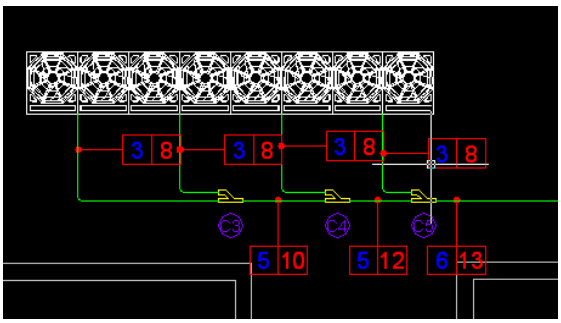


2. Place ODU Coupler insertion point above Refrigerant Pipe, and select the branching direction.

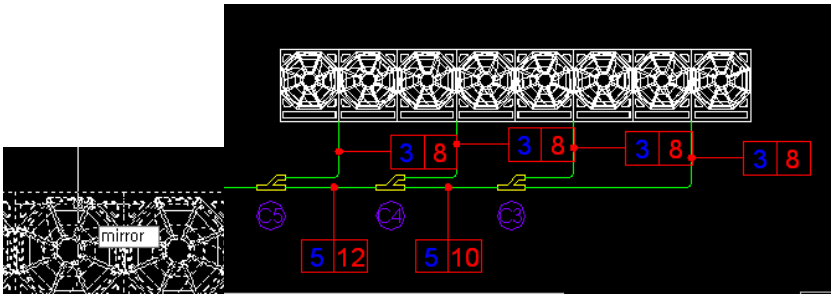


3. Connect from ODU Coupler to Outdoor Unit using Piping Equipment Menu in Symbol Pane.





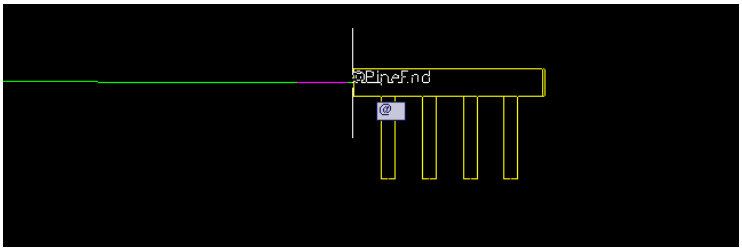
Caution! ODU Coupler's direction is useful to connect to only right side. If you want connect to left side, reverse the ODU equipment Using AutoCAD function "mirror".



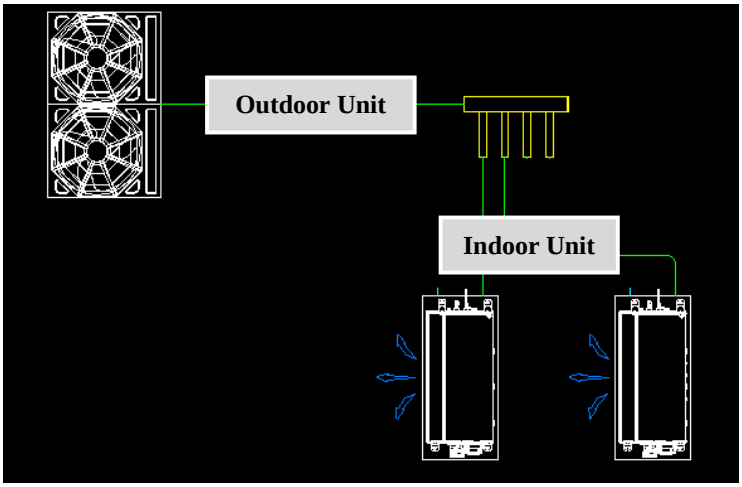
Header

1. Select Header in Pipe Material of Symbol Pane.

2. Place Header at the end of Refrigerant Pipe, and select the branching direction.



3. Connect from Header to Indoor Unit Refrigerant Pipe Port using Piping Equipment Menu in Symbol Pane.

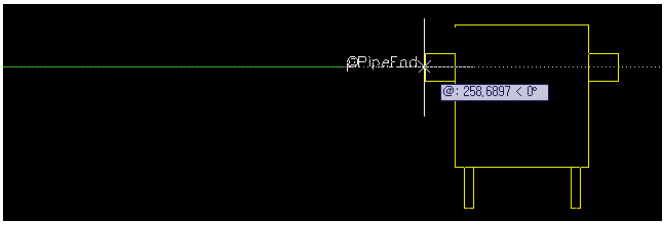


- Position Header 7Way and Header 10Way in the same way.
- Leave Connection that is unnecessary for piping as it is.

HR Unit

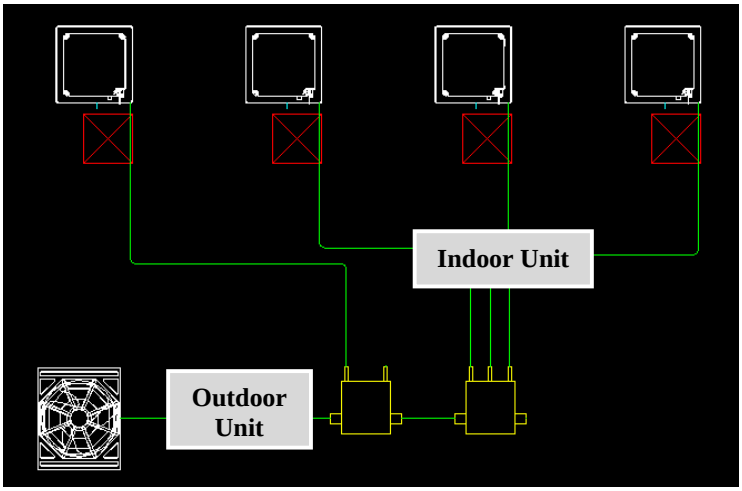
1. Select HR Unit in Pipe Material of Symbol Pane.

2. Place HR Unit at the end of Refrigerant Pipe, and select the branching direction.



Caution! HR unit has in-out port. The In port is Left port and the out port is Right port..

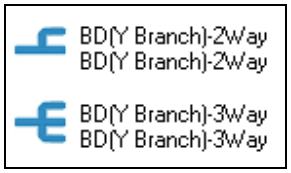
3. Connect from HR unit to Indoor Unit Refrigerant Pipe Port using Piping Equipment Menu in Symbol Pane.



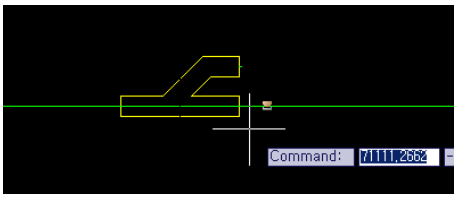
- Position HR Unit 3Way and HR Unit 4Way in the same way.
- Leave Connection that is unnecessary for piping as it is.

BD [Y Branch]

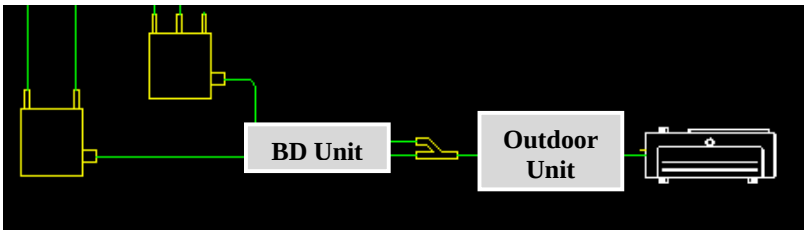
1. Select BD [Y Branch] in Pipe Material of Symbol Pane.



2. Place BD Unit at the end of Refrigerant Pipe, and select the branching direction.

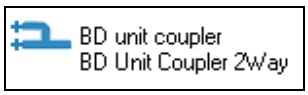


3. Connect from BD [Y Branch] to BD unit Port using Piping Equipment Menu in Symbol Pane.



BD unit Coupler

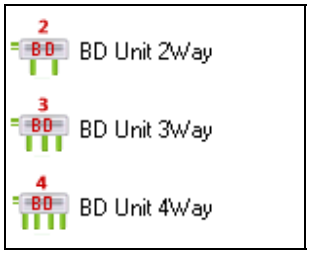
1. Select BD unit Coupler in Pipe Material of Symbol Pane.



2. Place BD Unit Coupler at the end of Refrigerant Pipe, and select the branching direction.

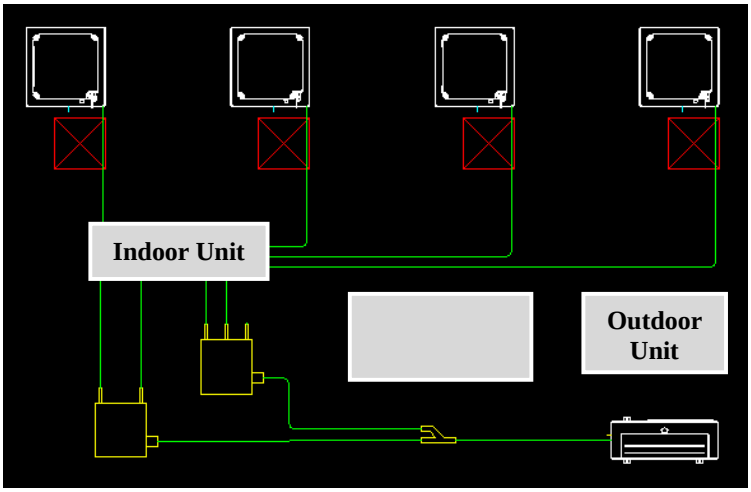
BD Unit

1. Select BD unit in Pipe Material of Symbol Pane.



2. Place BD Unit at the end of Refrigerant Pipe, and select the branching direction.

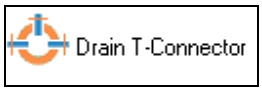
3. Connect from BD unit to Indoor Unit Refrigerant Pipe Port using Piping Equipment Menu in Symbol Pane.



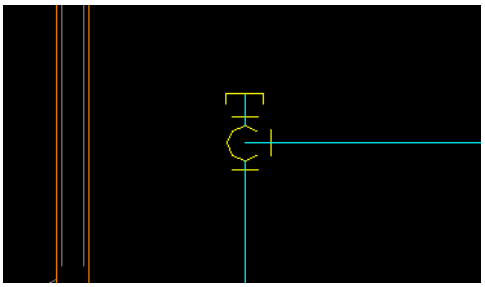
- Position BD Unit 3Way and BD Unit 4Way in the same way.
- Leave Connection that is unnecessary for piping as it is.

Drain T

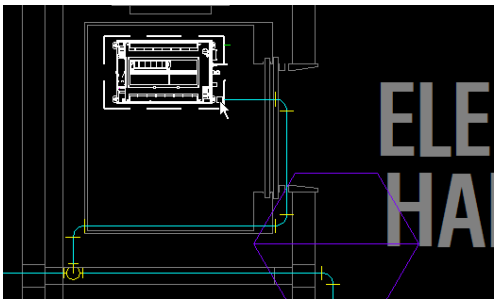
1. Select Drain T in Pipe Material of Symbol Pane.



2. Place Drain T insertion point above Drain Pipe, and select the branching direction.



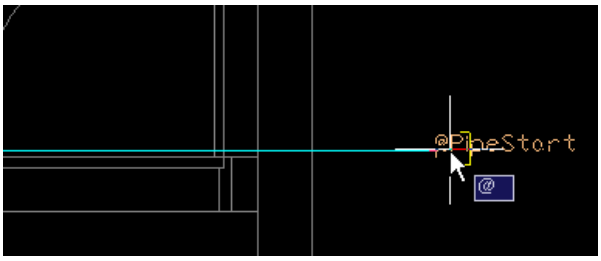
3. Connect to Indoor Unit Port using Piping Equipment Menu in Symbol Pane.



Drain Cap

1. Select Drain Cap in Pipe Material of Symbol Pane.

2. Insert Cap at the end of Drain Pipe.



Drain Exit

1. Select Drain Exit in Pipe Material of Symbol Pane.

2. Insert Drain Exit at the last exit of Drain Pipe.

- When Drain Exit or Drain Riser Hole is inserted, Drain Pipe Diameter can be automatically selected.

Control Solution

Controller may be positioned in the drawing.

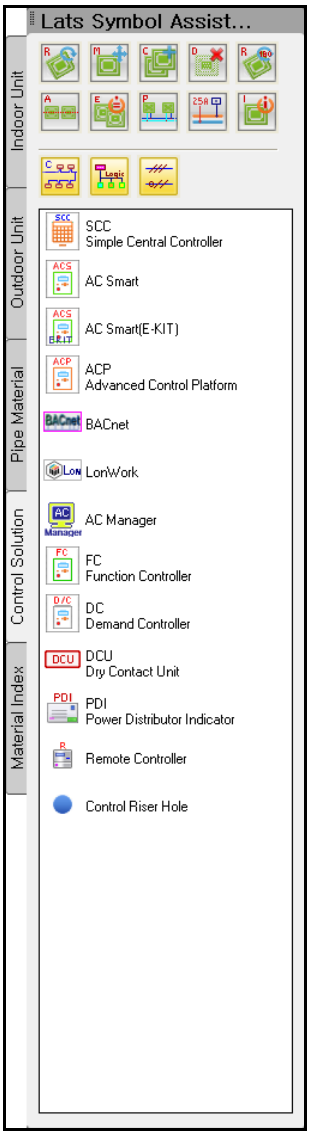
1. Double click the desired Controller Type.

2. Select the equipment to connect to calculate the minimum number of Controllers.

   - Refer to the maximum number of Indoor Units that can be connected to each Controller.

3. Position the Controller in the drawing.

4. Compose the logical connection relations between the positioned Controller and the equipments.



Control Port

Controller Positioning

1. Select the desired Controller in Control Solution Pane Menu and position it in the drawing.

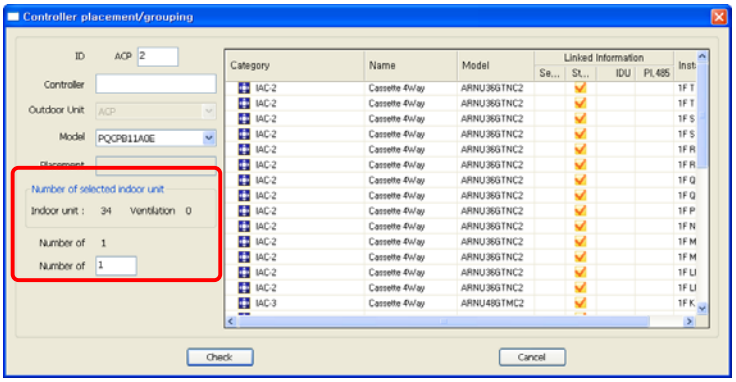
1.1 Select the equipment to connect (Indoor Unit, ventilation, Outdoor Unit, or Controller).

1.2 The minimum number of Controllers, considering the Controller type and the number of selected equipments, is calculated.

1.2.1 Select the desired Controller in Symbol Pane Menu.

1.2.2 Select as many Indoor Units (or ventilations) as desired.

1.2.3 The minimum number of Controllers, considering the maximum number of connected units for each Controller, is calculated.



1.3. Set the minimum number or more and position them in the drawing.

1.4 AC Manager, FC, DC, DCU, PDI, and Remote Controller may not select Indoor Unit (or ventilation) for the calculation of the minimum number.

SCC Simple Central Controller	Only Indoor Unit and ventilation may be selected
AC Smart AC Smart(E-KIT) ACP Advanced Control Platform BACnet LonWork	Only Indoor Unit, ventilation, and Controller may be selected
AC Manager	Only ACP may be selected
FC Function Controller	Only simple central Controller may be selected
DC Demand Controller	Only ACP may be selected
DCU Dry Contact Unit	Only Indoor Unit and ventilation may be selected
PDI Power Distributor Indicator	Only Outdoor Unit may be selected
Remote Controller	Only Indoor Unit and ventilation may be selected

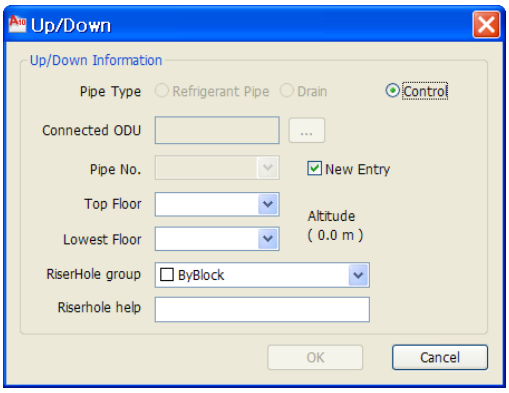
- For ACP and BACnet, the minimum number is calculated for each Product, and logical composition is done for each Port (4).

1.5 After positioning Controller, logical composition between Controller-Indoor Unit(or ventilation) is done through Control Logic Configuration Menu.

2. Select Control Riser Hole to position in the drawing.

2.1 Select Control Riser Hole.

2.2 Set Control Riser Hole conditions.



Material Remarks

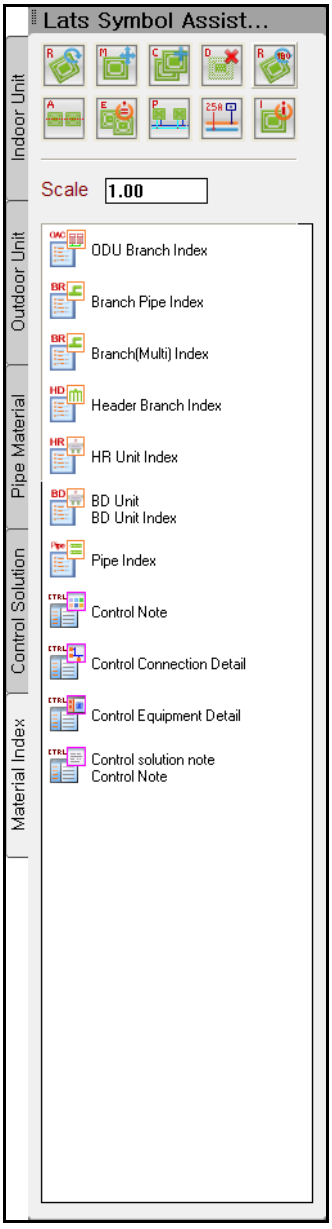
Material Remarks may be positioned in the drawing.

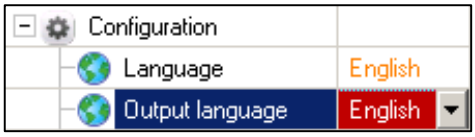
1. Double click the desired remarks and the detail diagram.

2. Insert in the desired location in the drawing.

- A separate table exists according to the set output language condition.

(Korean, English, Italian, German, French and Spanish)





Branching Pipes connecting between Outdoor Units

▣ Connection of Liquid & Gas pipe in Outdoor Units

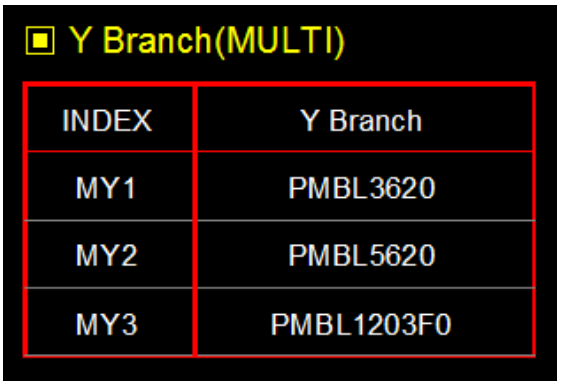
INDEX	Connection of Liquid & Gas pipe in Outdoor Units
C1	ARCNN20
C2	ARCNN30
C3	ARCNN21
C4	ARCNN31
C5	ARCNN41
C6	ARCNB20
C7	ARCNB30

Branching Pipes

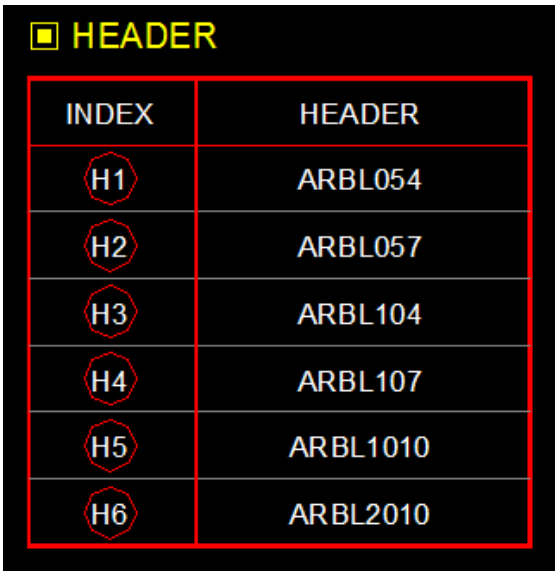
▣ Y Branch

INDEX	Y Branch
Y1	ARBLN01621
Y2	ARBLN03321
Y3	ARBLN07121
Y4	ARBLN14521
Y5	ARBLN23220
Y6	ARBLB01621
Y7	ARBLB03321
Y8	ARBLB07121
Y9	ARBLB14521

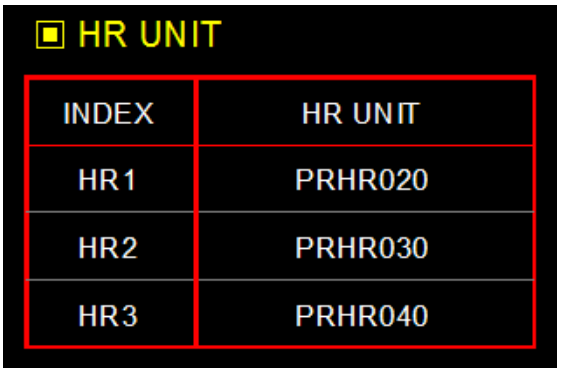
Branching Pipes (Multi)



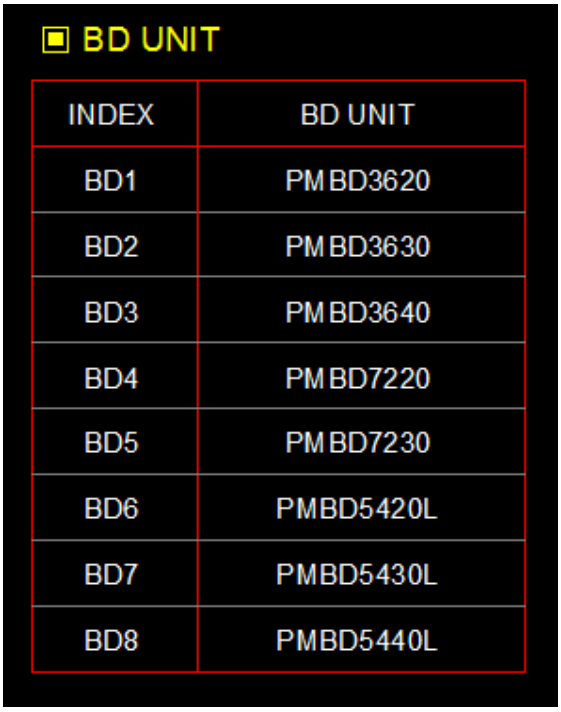
Header Branching Pipes



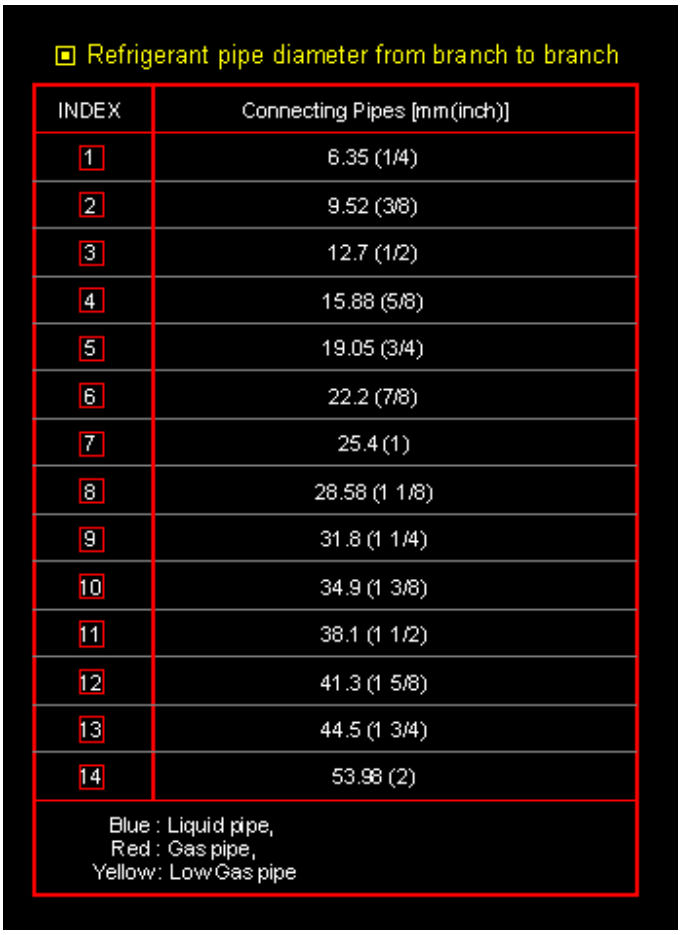
HR Unit



BD Unit



Pipe Notes



▣ Refrigerant pipe diameter from branch to branch

INDEX	Connecting Pipes [mm(inch)]
1	6.35 (1/4)
2	9.52 (3/8)
3	12.7 (1/2)
4	15.88 (5/8)
5	19.05 (3/4)
6	22.2 (7/8)
7	25.4 (1)
8	28.58 (1 1/8)
9	31.8 (1 1/4)
10	34.9 (1 3/8)
11	38.1 (1 1/2)
12	41.3 (1 5/8)
13	44.5 (1 3/4)
14	53.98 (2)

Blue : Liquid pipe,
Red : Gas pipe,
Yellow : Low Gas pipe

Control Solution Remarks

● Note
· Cable Standard
- Wired Remote Controller : AWG 22*3C(Less than 100m)
- PC~HUB~ ACP : UTP cable (Above CAT.5)
- ACP ~ ODU : Shielded wire thicker than 1.0mm2 (AWG 17 or above) * 2C
- ODU ~ ODU : Shielded wire thicker than 1.0mm2 (AWG 17 or above) * 2C
- ODU ~ IDU to IDU : Shielded wire thicker than 1.0mm2 (AWG 17 or above) * 2C
- W.H.M (Watt hour meter) ~ PDI : Shielded wire thicker than 1.0mm2 (AWG 17 or above)*2C

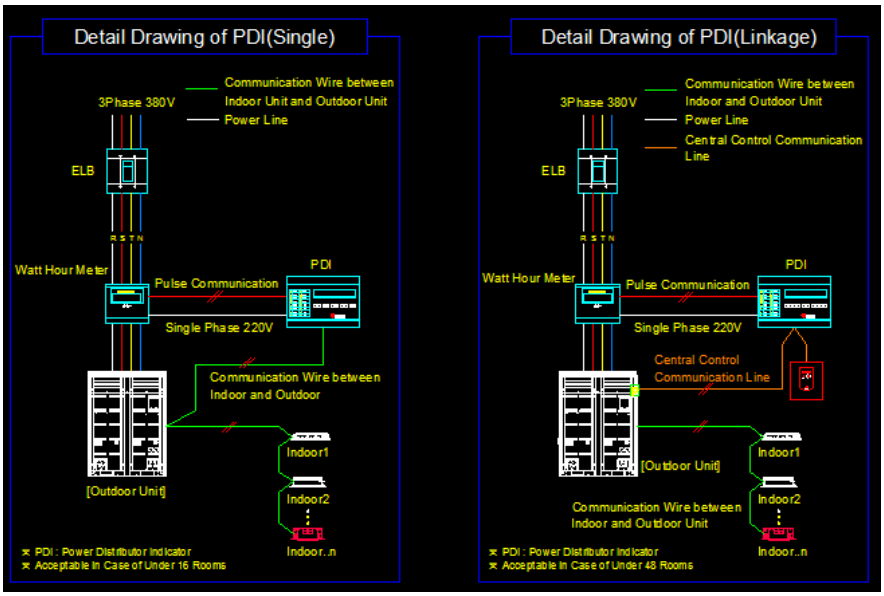
· Limitation of cable length
- S.C.C ~ Function Controller : Less than 1m
- Total 485 comm. Cable length : Less than 1000m
- IDU ~ Wired Remote Controller : Less than 50m
- ACP ~ HUB (UTP cable length) : Less than 80m

Total number of 485devices(central controller, PDI and PI485) should be fewer than 32ea
One PI485 can supply electric power up to two S.C.Cs
(required extra two core cable),
In case of power supplying more than two S.C.Cs, use other PI485 or adapter (SMPS)

Control Connection Detail Diagram

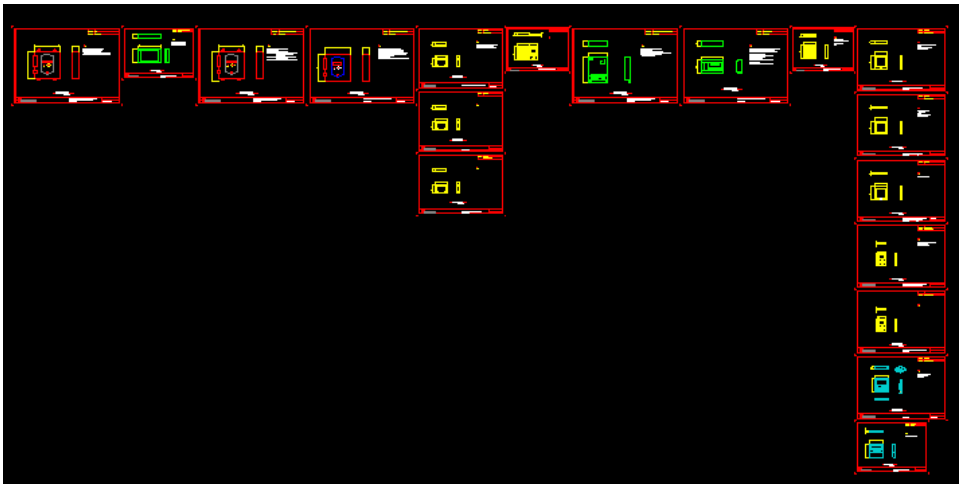
After inserting in the drawing, delete unnecessary connection detail diagrams.

For overseas, DC is not used, and there is no connection detail diagram.



Control Product Detail Diagram

After inserting in the drawing, delete unnecessary product detail diagrams.



Others

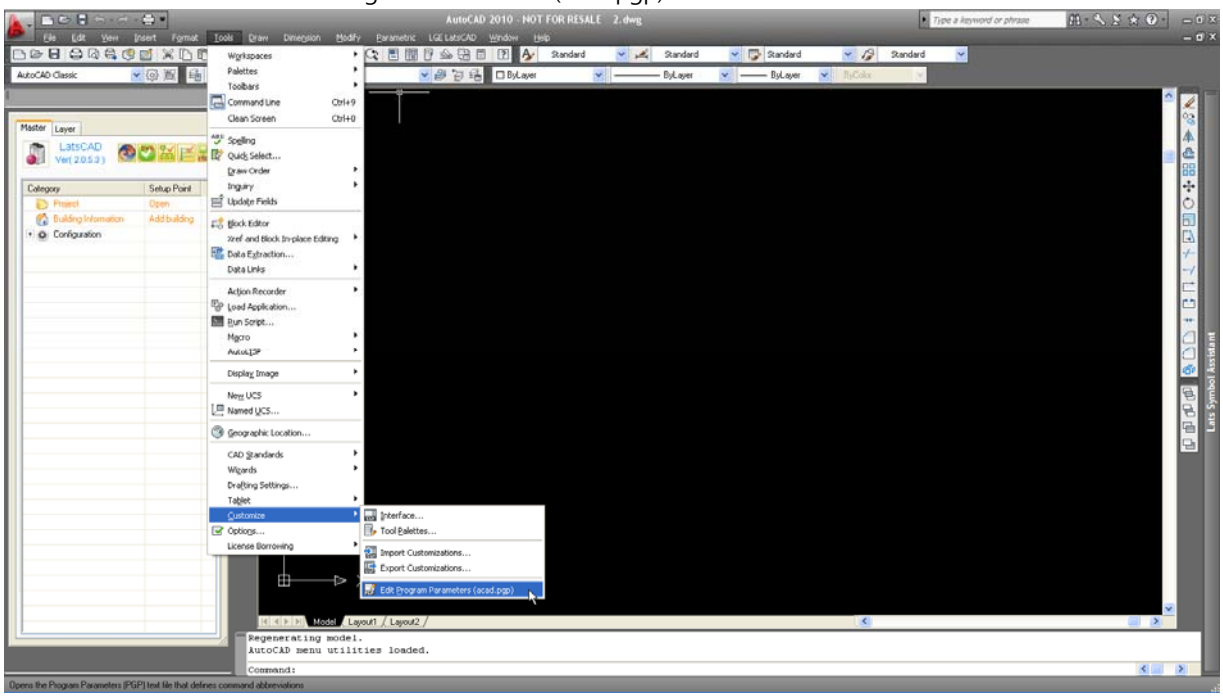
This chapter is written about explanation of useful function in using LATS CAD.

Adding LATS CAD Shortcut

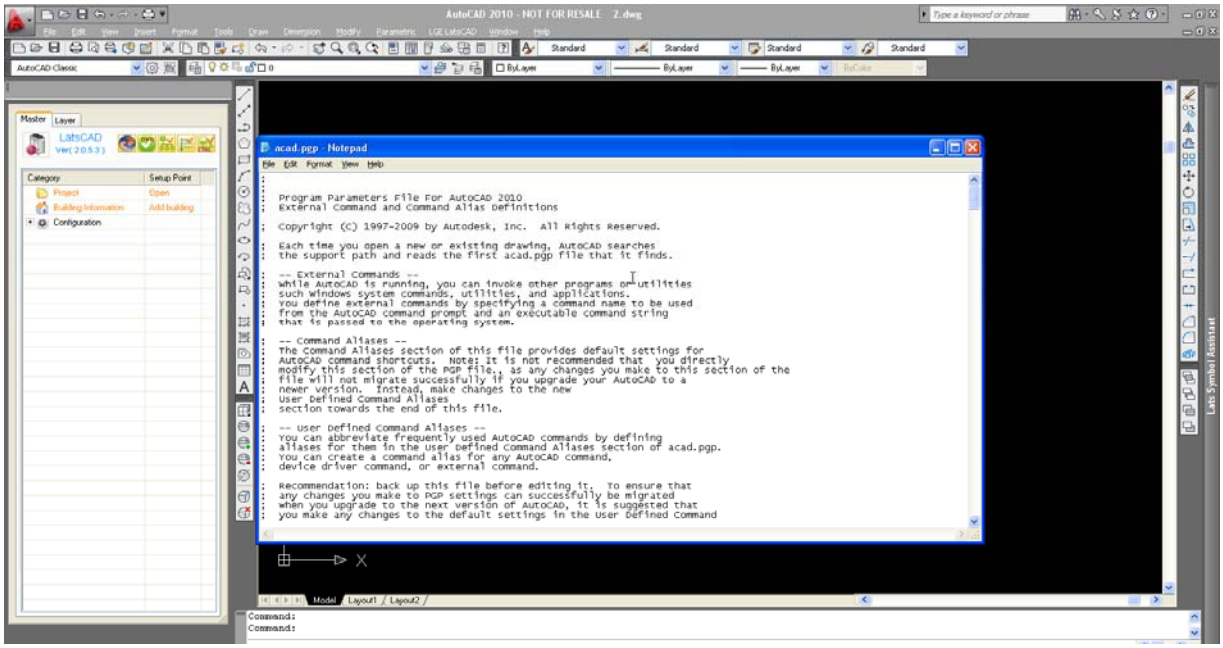
If you'd rather use the keyboard of your computer instead of the LatsCAD icons for the usual commands you should proceed as it follows.

1. For Adding LATS CAD shortcuts choose tool on the menu bar, customize, and edit program parameter after opening "acad.pgp" file.

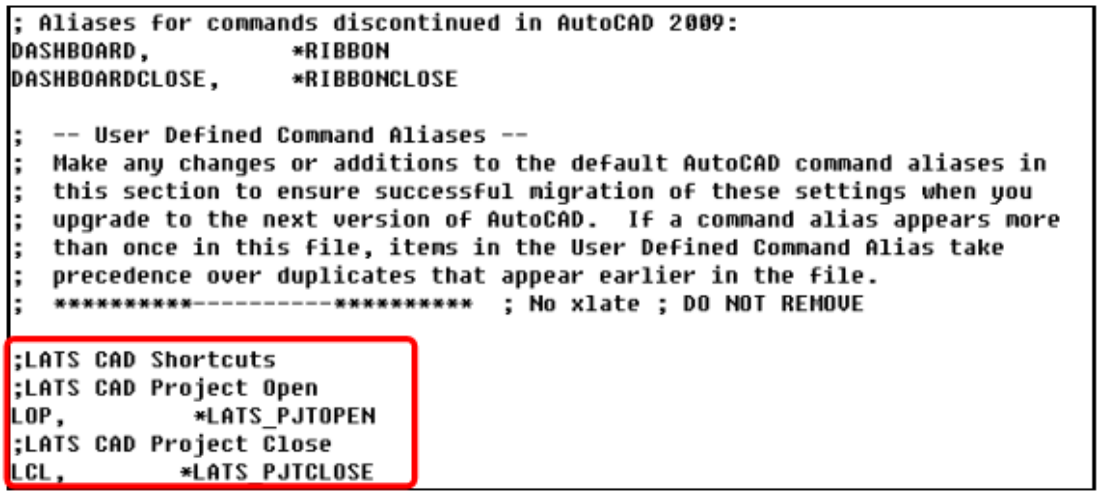
Tools → Customize → Edit → Program Parameters (acad.pgp)



2. Open “acad.pgp”


acad.pgp - Notepad
Program Parameters File For AutoCAD 2010
External Command and Command Alias Definitions
Copyright (C) 1997-2009 by Autodesk, Inc. All Rights Reserved.
Each time you open a new or existing drawing, AutoCAD searches
the support path and reads the first acad.pgp file that it finds.
-- External Commands --
While AutoCAD is running, you can invoke other programs or utilities
such Windows system commands, utilities, and applications.
You define external commands by specifying a command name to be used
from the AutoCAD command prompt and an executable command string
that is passed to the operating system.
-- Command Aliases --
The Command Aliases section of this file provides default settings for
AutoCAD command shortcuts. Note: it is not recommended that you directly
modify this section of the PGP file., as any changes you make to this section of the
file will not migrate successfully if you upgrade your AutoCAD to a
newer version. Instead, make changes to the new
User Defined Command Aliases
section towards the end of this file.
-- User Defined Command Aliases --
You can abbreviate frequently used AutoCAD commands by defining
aliases for them in the User Defined Command Aliases section of acad.pgp.
You can create a command alias for any AutoCAD command,
device driver command, or external command.
Recommendation: back up this file before editing it. To ensure that
any changes you make to PGP settings can successfully be migrated
when you upgrade to the next version of AutoCAD, it is suggested that
you make any changes to the default settings in the User Defined Command

3. Drag the scroll bar to the end of the contents and add each shortcut and their full commands.


; Aliases for commands discontinued in AutoCAD 2009:
DASHBOARD, *RIBBON
DASHBOARDCLOSE, *RIBBONCLOSE
; -- User Defined Command Aliases --
; Make any changes or additions to the default AutoCAD command aliases in
; this section to ensure successful migration of these settings when you
; upgrade to the next version of AutoCAD. If a command alias appears more
; than once in this file, items in the User Defined Command Alias take
; precedence over duplicates that appear earlier in the file.
; ********** ********** ; No xlate ; DO NOT REMOVE
;LATS CAD Shortcuts
;LATS CAD Project Open
LOP, *LATS_PJTOPEN
;LATS CAD Project Close
LCL, *LATS_PJTCLOSE

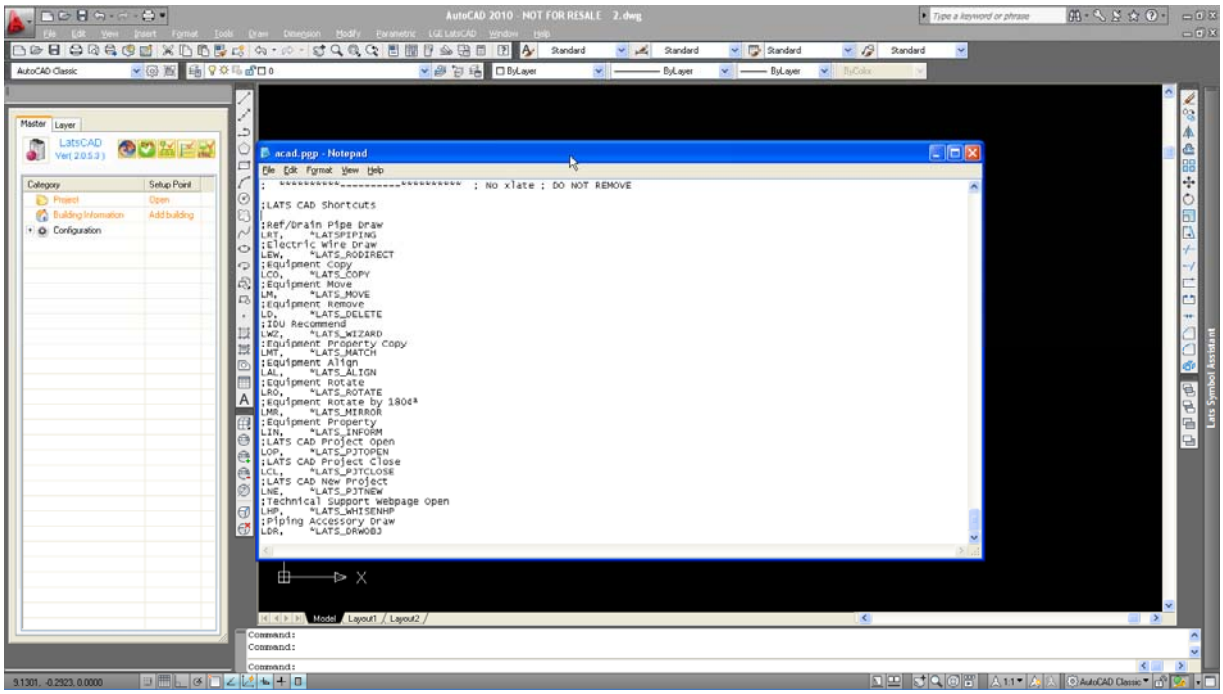
4. In the following you will find the list of Shortcuts. LATS CAD Users can change shortcuts between LATS CAD Shortcuts Start and End. The USER is responsible for any problem that may happen after changing shortcut by him (her) self.

LATS CAD Shortcuts Start
; LATS CAD Project Open
LOP, *LATS_PJTOPEN
;LATS CAD Project Close
LCP, *LATS_PJTCLOSE

;LATS CAD New Project
LNP, *LATS_PJTNEW
;Project Drawing Output
LEP, *LATS_PJTEXP
;Project Save
LSA, *LATS_SAVE
;Project Save as
LSP, *LATS_PJTSAVEAS
;Product Information
LHP, *LATS_WHISENHP
;Open Manual
LOM, *LATS_MANUAL
;Drawing Refresh
LDI, *LATS_INITDWG
;Piping Accessory Draw
LDR, *LATS_DRWOBJ
;Rotate Equipment
LRO, *LATS_ROTATE
;Move Equipment
LM, *LATS_MOVE
;Copy Equipment
LCO, *LATS_COPY
;Delete Equipment
LD, *LATS_DELETE
;Rotate Equipment (180)
LMR, *LATS_MIRROR
;Equipment Line Up
LAL, *LATS_ALIGN
;Match Symbol Feature and Equipment Property
LMA, *LATS_MATCH
;Piping Equipment
LRT, *LATS_PIPING
;Equipment and Pipe Index
LAN, *LATS_ANNOTATION
;Property Information
LIN, *LATS_INFORM
;Auto-arrange Indoor Unit
LWZ, *LATS_WIZARD
;Show Master Menu
LPM, *LATS_PANEMENU
;Show Symbol Menu

LPS, *LATS_PANESYM
;Building Board Composition
LBR, *LATS_BORDER
;Schematic (Refrigerant) Diagram Equipment Arrangement
LRD, *LATS_RISEREQ
;Schematic (Control) Diagram Equipment Arrangement
LCD, *LATS_RISERCTRL
;IDU Logical Relationship
LLR, *LATS_LOGILNK
;Drawing Output Utility
LOU, *LATS_PLOT
;BRMS file
LBRMS, *LATS_BRMS
;Excel Sheet Template Open
LBT, *LATS_BLDGTEMP

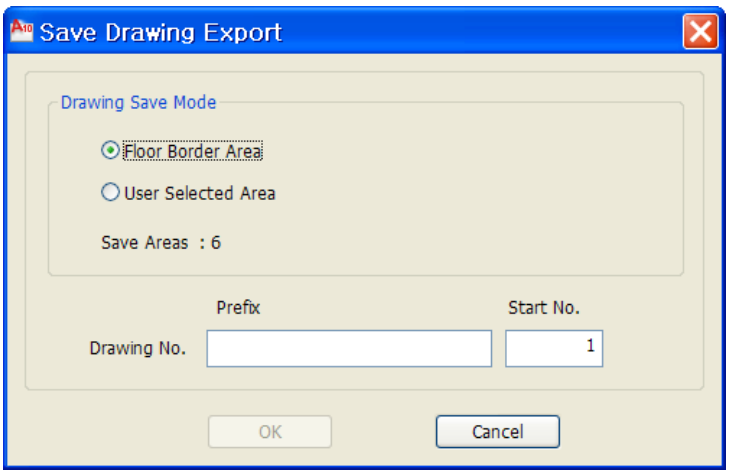
5. Save "acad.pgp."



6. Close Notepad
7. Close AutoCAD
8. At the next opening of AutoCAD you will be able to use the short keys for LATS CAD.

Project Drawing Output

Entire drawing can be saved to individual files according to the saving mode. (LGE LATSCAD)

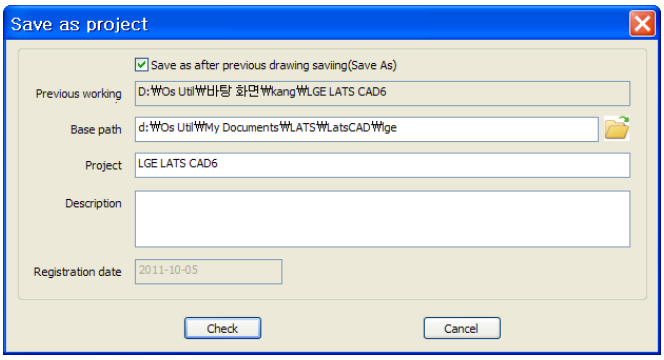


- It is saved by creating a folder called SaveDWG in Project folder.

Save Project as a Different Name

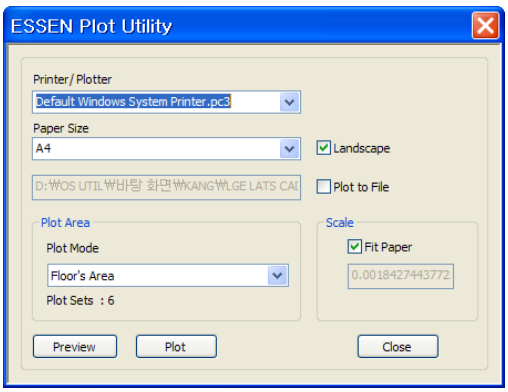
Entire Project contents may be saved as a different name. (LGE LATSCAD)

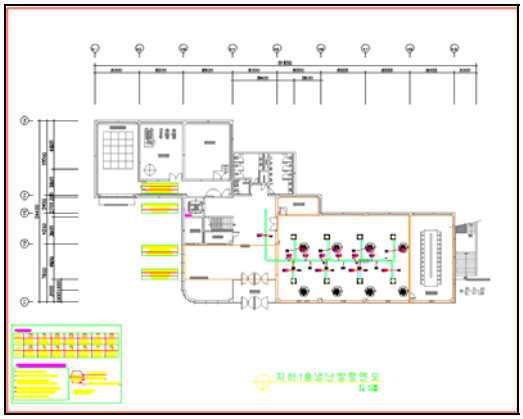
Input save path and Project name.



Drawing Print Utility

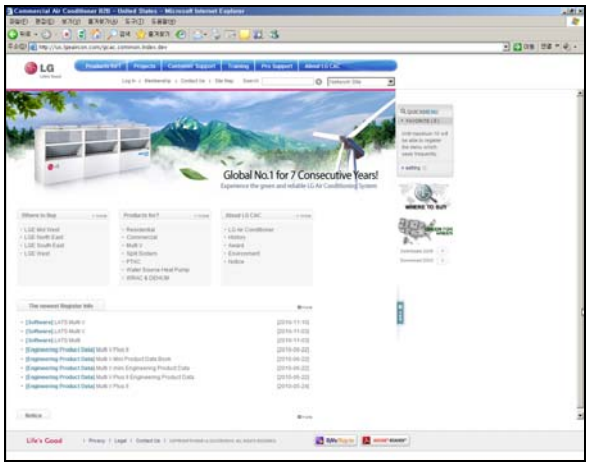
Output is possible after setting printer, paper size, and the output target. (LGE LATSCAD)





Product Information

Product Data can be verified by accessing LG Electronics System Air Conditioner Homepage. (LGE LATSCAD)



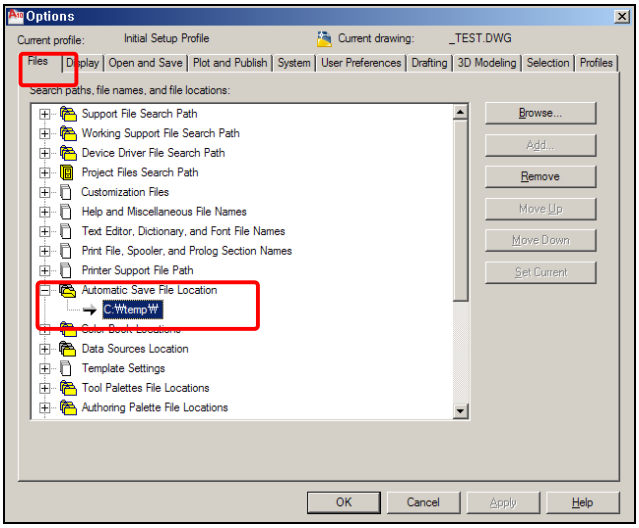
Utilizing Automatic Save Function

Drawing is automatically saved using the Automatic Save function of AutoCAD.

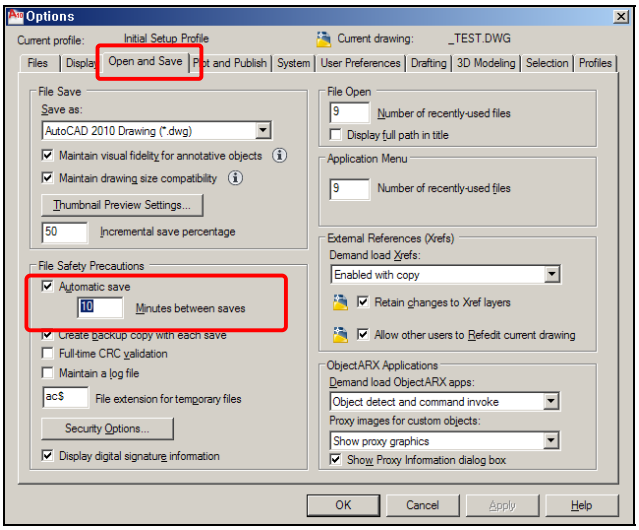
1. Input AutoCAD Command Options.

2. Verify the automatic save location in File tab.

2.1 It is automatically saved in the folder of the corresponding path, and the path may be changed.



2.2 Automatic Save Period may be set in Open and Save tab.



3. It is saved with the extension sv$ File format, and it can be converted and used as dwg File format if necessary.

4. During the File recovery, use it by pasting the File converted from sv$ to dwg in the corresponding Project folder.